Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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With the Editor

FALL SHOWINGS of new furniture, automobiles, radios, musical instruments, novelties and toys reveal much that is original in design and attractive in color. Every alert manufacturer realizes that utility values today must be appropriately dressed up and attractively presented to win attention, to hold interest, to create the desire to buy, and to perpetuate pride in ownership. It is stimulating to "window-shop" and see what progressive concerns have originated, developed or adopted to build volume sales. Reports from various sources show that many manufacturing concerns are enjoying a record volume of business—evidence that people have money to spend and are spending it in vast amounts.

Of course, it would be a confession of blindness to ignore the fact that some concerns are not enjoying a healthy run of business. This is no new condition. The pressure of new kinds of competition in every industry is making hills and hollows in the surface of industrial activity, and the concerns that find themselves in the depressions, while they see others occupying the high places, have something hard to think about.

A thorough diagnosis of their condition, by an expert from outside of the organization, will reveal what is needed. It may be a major operation—a change to an entirely different line of products, or removal of the plant to another locality. But more often something less drastic will be effective, for example, redesign of the product, reorganization of the personnel, more careful buying and storing of materials, improvement of production facilities, a more aggressive selling program or increased advertising to promote sales.

O. H. Rohr

Managing Editor

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The basic differences between pyroxylin materials and the older type of finishes are not always clearly understood. L. P. Nemzek of the du Pont organization briefly discusses the behavior of lacquers as the result of drying by evaporation. He shows how "sinking" is caused and how it can be avoided.

Sinking of Lacquer Finishes
—*What it is and why it occurs*

Director of Industrial Sales of E. I. du Pont de Nemours & Co., Inc., writes of characteristics of pyroxylin film from the point of view of the buyer of finishes.

By L. P. Nemzek

AN oil or varnish film does not "dry" in the true sense of the word.

When clothes dry or the earth dries after a rain, the clothes or the earth actually lose weight from the drying out of the water.

An oil or varnish film "dries" in that it ceases to be wet; but instead of losing weight by evaporation of some of its substances, it actually gains in both weight and volume. The increase in weight and volume comes from the absorption of oxygen from the air. The film is changed from one material to another by a chemical reaction; it is therefore said to dry by oxidation.

Because the varnish film does not decrease in volume on drying, little or no sinking takes place even when the grain of the wood is pronounced.

But Lacquers Dry By Evaporation

A lacquer, however, dries in the ordinary meaning of the word—simply by evaporation. The pyroxylin film decreases both in weight and in volume as the solvents come out. Oxidation has no part in this process.

Lacquers May Sink Badly

This method of drying has very considerable advantages. However, if the solvents in a lacquer are incorrectly balanced so that the film continues to decrease in volume over a long period after apparent setting up has occurred, the sinking of the lacquer into the grain of the wood will become pronounced a week or two after the article has been finished.

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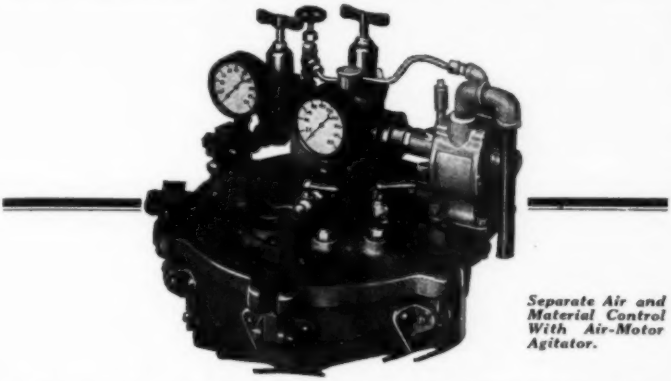

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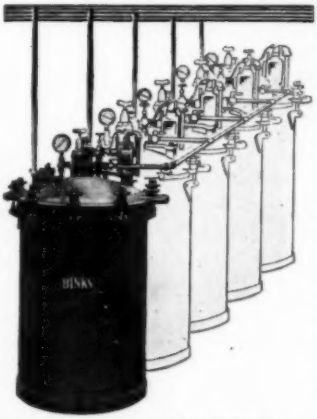

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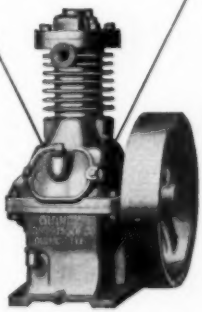

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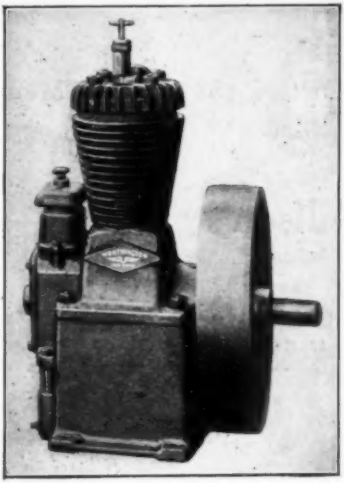

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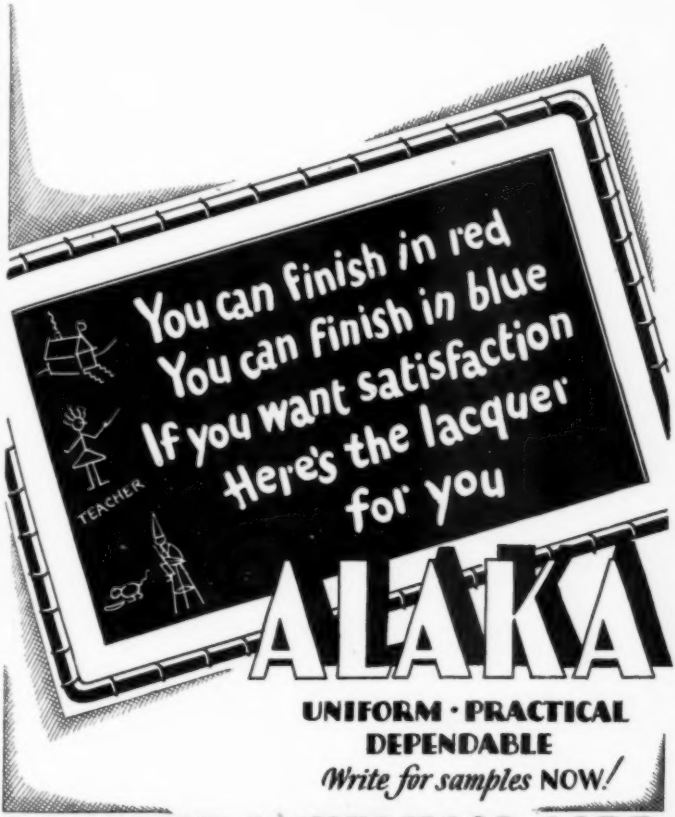
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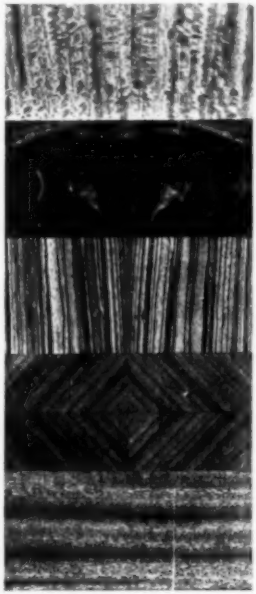

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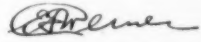

Reclaim Waste Materials? No! Save Materials? Yes!

Superintendent of a St. Louis factory explains why plans to reclaim wasted spray failed, but outlines methods by which a considerable saving was made in new materials

By E. F. Werner

THERE IS considerable material shot into the air and onto the walls of spray booths day after day; the amount, figured in percentages prepared by the various spray gun manufacturers, is tremenduous. Our company, in line with many others, believed that this loss could be reduced and steps were taken accordingly.

Our Special Precautions

The walls of the booths, floors and stands used in connection with the work were carefully cleaned each evening. Special sawdust cuspidors were provided for each operator so that the lacquer dust would not be contaminated by tobacco spit. Every precaution for cleanliness was adopted, and the sweepings were carefully saved.

After we had what we thought was an amount worth reclaiming, the material was sifted through a finely-divided mesh screen and then dissolved in thinner and other ingredients. The material seemed satisfactory and we decided to use it as an undercoat on several cheap jobs that we had going through the plant.

We had no luck at all! When the reclaimed material was applied, it was lumpy, full of dirt and hard to sand; it was everything except what we wanted it to be. We just took that batch of material, called it a bad investment and threw the entire lot down the sewer. It was lucky for us that we did not stop up the sewers. We have heard several times that this kind of material has been salvaged and we certainly would like to save it if there is a real saving, but we are not going to fool ourselves in doing it—not under present conditions.

We did make some savings on materials that were almost waste, or if not that exactly they were what might be termed "slow moving." For example we would have a special job calling for a pea green color and, along with the quantity of material needed for this job, we would make a small additional quantity.

Special Mixtures Left Over

This extra material was kept for the "job that might come in

some day" of the same color or shade. Then too, we might have a call for a Nile green, an apple green or any one of the popular shades. This resulted in the accumulation of many partly filled cans of material that amounted to a considerable quantity when measured in the total.

This practice has been stopped. We now have one can of green; whatever is left is poured back into one container. If the next job is slightly lighter or darker, the addition of other pigments takes care of this. The same change has been made in all the shades and, instead of having 35 or 40 small cans around the booth, we now have approximately ten. If a shade is too much off color it is poured into our gray mixture and used later for miscellaneous spraying and first coater work.

Practically, the same principle was applied in our varnish room. Can after can of special mixtures, shellacs and substitutes and what not, all being saved for the day they might be used, were emptied. Some of the materials were saved for odd jobs around the plant, such as mixing with pigments for making battleship gray to be used on fences and other parts that need some sort of painting.

Thinner For Cleaning

Formerly, we used thinner for cleaning the spray guns, and then tried to use this material for pigment work, but this proved unsuccessful. The same method was tried in saving the materials used in cleaning spray gun cups and other parts, but the cheapest thing found in the long run is a special c h e a p "gun cleaner" which can be thrown away when it becomes too dirty.

All this special mixing and salvaging used to be carried on under the personal supervision of the foreman who thought he was actually saving the company money. He was paid on a weekly basis and no record was ever kept of the time he spent on any one job. It was difficult to explain to this man that while he was doing this particular work, the possibilities were that something of real value was going to waste because of lack of proper supervision.

Store Room; Cup Guns

The results of salvaging being so poor, we decided to save by reducing the amount of materials lost during the day's operations. The first was the loss at the store room. All employes got materials from the store room as they needed them, and this meant that the floors were filthy—and no one person could be held responsible. Now, one man gets all materials from the store room and distributes them to the various booths.

The old style cup guns then came in for their share of criticism. We do not for a minute mean to minimize the value of this type of equipment for certain phases and kinds of work; in fact, we still use several around the plant, but not on production work. The time spent in filling the quart cups, in addition to the materials spilled on the floor, amounts to a substantial total. This has been eliminated by the use of the gravity bucket type. Some companies use the pressure system, but in our plant we prefer the gravity type.

Improved Spraying

Another waste in custom work occurs through variations in the sizes of articles to be sprayed. In

(Continued on page 119)

Decorative color scheme on U. S. Navy airplane: Fuselage and underside of wing, aluminum; Top of wing, chrome yellow; Rudder, broad lines of red, white and blue; Lettering and star insignia, navy blue.

Finishing Modern Airplanes In Color

How airplanes are finished for protective permanence and decorative effect in the new and modernly equipped plant of the Fairchild Aviation Corp., at Farmingdale, Long Island

By D. O'Brien

AT THE American Railway convention held at Atlantic City in June, Major Clarence M. Young, director of aeronautics of the Department of Commerce said: "There is only one death to every 380,000 miles covered by flying machines." This statement, based on concrete statistics and emanating from an authorized source, emphasizes the safety of the new mode of travel.

The Fairchild Aviation Corp., has completed a $1,000,000 airplane plant and flying field at Farmingdale, Long Island, N. Y. Among the many features incorporated in the plant is an up-to-date paint shop where ideal conditions permit the turning out of the ship beautiful—the Rolls Royce of the air.

Twofold Purpose of Finish

Heretofore, airplane painting was confined to the doping of the fabric as a means of safety only; no thought was given to the decorative features of the painting scheme. Today the Fairchild Aviation Corp., is producing ships in two-tone colors, striped, lettered and decorated so tastefully that they vie successfully with the modern automobile in beauty. While the decorative paint scheme is featured, the painting for protective purposes and safety are of prime importance, of course.

The fuselage frame, which is made of metal tubing, is thoroughly cleaned of all evidence of rust, then primed with a rust inhibitive primer, sanded and coated with nitrocellulose lacquer. This metal tubing is not exposed but is enveloped in a finely-woven fabric. The fabric is treated with a clear and pigmented dope. The nitrocellulose

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Zapon Sanding Sealer No. 1038 has proven a boon to hundreds of furniture finishers. It cuts costs and speeds production. We believe it will revolutionize furniture finishing within the next few months. After you read about this wonderful sealer, send for a free, generous sample and check our claims as you test it out in your own plant.

ZAPON Sanding Sealer No. 1038 is not a substitute for shellac although it is priced considerably lower than a good grade of shellac. It is a high grade pyroxylin lacquer sealer (not a spirit varnish or substitute shellac) which we have developed for manufacturers who want a sealer which will fill the pores, dry in one third the time of shellac and sand easier than shellac. Zapon Sanding Sealer No. 1038 will not only give you the results you have been getting with expensive shellac, but it will give you several things that shellac will not.

One spray coat of Sanding Sealer No. 1038, will fill the pores and has body enough to seal free from pinholes and level perfectly. It dries in one third the time of shellac. It will not bleed stains or bleach fillers.

You will like the free flowing quality and the remarkable freedom from orange peel in the finish that Sanding Sealer No. 1038 produces. You will like the way this sealer works as it builds rapidly and drys quickly.

The finish produced by this sealer will satisfy you. It is clear, transparent and absolutely free from any grayish cast. Like all lacquers it is waterproof. As a first coater it furnishes perfect adhesion for lacquers, which shellac fails to do. Many manufacturers have found it an ideal first coater for use under varnish.

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8. Absolutely free from grayish cast
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dope, being heavy bodied, is thinned to air-brush consistency with a nitrate thinner.

Finishing Fabric

The wings, elevators, tail and ailerons are also covered with the same fabric as is used on the fuselage, and these parts are accorded the same treatment. The fabric is mounted permanently upon its respective forms and sent to the dope room. Here the dope is used full-bodied without thinning. It is put on with 5-in. bristle wall brushes. The fabric is given a coat of pigment dope and allowed to dry.

The second operation consists of covering all seams. This is accomplished by applying dope to all seams. While this dope is still in a tacky state, strips of fabric 2¼ and 3-in. wide are placed over the doped seams. Perfect adhesion is an essential requisite, and extreme care is exercised by the mechanics to see that no air pockets form in the seam coverings.

A second coat of dope is then applied over the entire surface; after it dries, it is thoroughly sanded and a third coat of this heavy-bodied pigmented dope is applied.

After all fabric-covered parts are finished in the dope room, they are conveyed to the assembly shop where the ships are built. The assembled ship is then conveyed to the paint shop. It is here that the ship is decorated.

Applying Color to Fuselage

In preparation for a two-tone job, the fuselage is masked at the stream line with paper and an adhesive masking tape. Either color is applied and then allowed to dry, after which the second color is applied.

On the fabric parts of the ship, dope is again used, but in this instance it is thinned with nitrate thinners to air-brush consistency. In this process, two coats of colored, pigmented dope are required and these are applied with an air brush. After the dope has set, a coat of gloss solution is given the fabric.

The metal parts, which are duralumin, are now ready for the finishing process. As the present Fairchild airplane is a cabin ship, with seating capacity for four passengers and a pilot, the cabin and doors are fitted with non-shatterable glass. This glass and the dope on the fabric are masked in order that the nitrocellulose lacquer, which is used on the metal parts, may not attack the finished dope.

Finishing Metal Parts

The metal parts of the ship are finished after the same manner of a first-class automobile, except that in no instance is amyl-acetate used. The solvents, thinners and pigmented dopes are all nitrocellulose. This is done so that a nitric acid action on cellulose will exist instead of acetic acid on cellulose. The cabin and baggage doors are the same color as the fuselage, the division of colors being made at the stream line.

The cowling over the engine, the spinner and nose of the propellor, the landing gear and wheels, and the struts are usually painted black. The wings are generally yellow, thus with a two-tone paint job on the body, four colors in all are used.

The body, from the cowling to the tail, is now striped—for example, using an oblong box stripe 1-in. in aluminum, with a vermilion edge fine line. Monograms,

trade names or marks, or anything in the manner of decoration the purchaser may desire, can be incorporated on the body of the plane between the stripes.

While I have mentioned certain colors, these are merely examples for illustration. The decorative scheme is not confined to a limited set of colors; all the colors of the spectrum are used.

Decoration of Interior

The interior of the cabin is upholstered in various hues of cloth, or beautifully colored fabrikoid. The metal parts of interiors of the cabin are treated with gray lacquer.

When the lettering and striping are to be in color, pure japan color is used and a protective coating of varnish (consisting of a fixed china wood oil), is applied. All colors, dopes and lacquers must measure up to a high standard of impermeability and perfect adhesion. Blushing, which is indicative of the presence of water, is made negligible by the use of anti-blush solutions.

Many concerns are now keenly aware of the fact that the airplane is not only a vehicle of commercial convenience, but it can be of great economic value as an advertising medium with the name of their business painted in bold letters on the sides of the plane.

Custom Finishing Motor Truck Cabs

A motor truck cab usually doesn't appeal strongly to the man who is interested in finishing methods. "They are just slapped together and then given a coat or two with an air gun," is the way the average man dismisses the matter.

But at Cortland, N. Y., where the Brockway truck is made, the visitor sees a wood cab unusually well made and finished. Perhaps this is the reason the trucks have built up a reputation that causes owners to come back and re-order. An instance is related of one truck body that has been back to the factory for fitting to its fourth chassis, the former chassis having been worn out,—wrecked or exchanged for a heavier model. Although about 3000 of these trucks are turned out annually, their manufacture is less a "production job," and more a matter of quality workmanship.

These cabs go through all finishing operations before being mounted. Although the spray gun is used for body work, the cabs are finished entirely by hand brushing.

A priming coat forms the basis for all subsequent coats of finishing material. Then a vigorous hand sanding smooths this off and prepares for the lead and putty treatment. Two coats of color are applied and striping follows. Following this, the varnish coats are applied. When these are all on, the cab is really a thing of beauty as well as utility and durability.—D. A. H.

A. C. Horn Co. Publishes New Brochure

A. C. Horn Co., Horn Bldg., Long Island, N. Y., makers of fine paints, varnishes, enamels, lacquers and waterproofing materials, has ready for distribution a new booklet entitled "Tx-Crete, For One-Operation Texturing." It contains 24 pages, size 8½ by 11-in., and explains the possibilities of this plastic texturing material which is available in many tints and shades of all colors.

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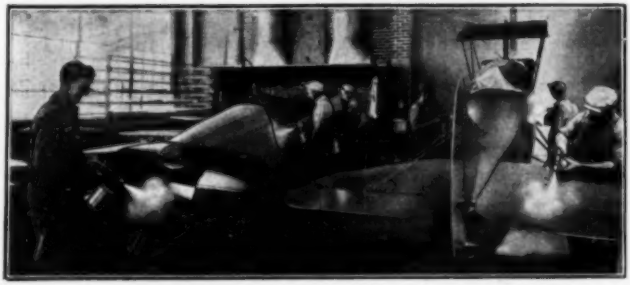

"Travelair" selects the Curtis for spray work.

In the Travelair manufacturing plant at Wichita, Kan., the fuselage finish and the protective coating on the wings are applied by compressed air supplied by a Curtis Compressor.

The famous plane, Woolaroc, which made the Honolulu flight and which was built by Travelair, was sprayed with this same Curtis Compressor equipment.

The Curtis Compressor is the first choice whenever reliability is a consideration.

This is largely because of the Curtis Controlled Splash Lubrication System which is found only in the Curtis.

Not only does this make an important saving in the amount of lubricating oil used, but more important, it helps prevent clogging of the filters with excess oil.

That is why you will find that the Curtis is the preferred compressor, both with users and with manufacturers of spray painting equipment.

Curtis

ST. LOUIS

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Curtis Pneumatic Mchy. Co., 1977 Kienlen Ave., St. Louis; 5518-D Hudson Term., New York

"We are using lacquer in connection with the finishing of tennis rackets. Have considerable trouble in humid weather on account of the water which is in the air. We had separators made which act fairly efficiently until the humidity gets up to around 95%. When that condition arises we practically have to shut down lacquering. We might say that we are spraying the lacquer.

"Even on somewhat drier days blushing occurs due to the presence of moisture in the room which collects on the lacquer surface when it is drying. Can you tell us how this problem is met in other plants, particularly automobile plants where much larger quantities of lacquer are used than we use and where the problem, we should think, would be much more acute?"—N. M. Co., per A. E. T., Supt.

Lacquer Blushing

In answering the question stated above, the author reveals in detail the cause of blushing and explains how it may be overcome satisfactorily and economically, regardless of what conditions prevail

By C. F. Merrifield

I AM NOT at all surprised that you get blushing troubles when spraying lacquer at a relative humidity of 95 percent. Most good grades of clear lacquer today are made to withstand a relative humidity of 70 to 75 percent without blushing. It is almost impossible to make a practical clear lacquer which will not blush at a relative humidity in excess of 75 percent.

The installation of efficient separators in your compressed air lines is a wise move under such severe conditions, but the removal of the accumulated water in the air line is not alone sufficient to prevent your troubles. Even with perfectly dry air you will probably get blushing at a relative humidity in excess of about 75 percent, as the moisture in the air, that surrounds the work while it is drying, is just as treacherous as the moisture in the compressed air with which the lacquer is applied.

Moisture or oil in the air line is caused by the air not having the same capacity for water vapor after being compressed, as it had when it was free air. Also, the sharp turns and angles in the air line have a tendency to throw out any oil or water entrapped by the air. Furthermore, the compressed air often becomes chilled after being compressed and this reduces the capacity of the air to hold water vapor, with the result that some of the entrapped moisture is precipitated. In addition, loose-fitting pistons and rings in the compressor may allow oil to pass by into the air line.

It is not unusual, during humid weather, to draw a gallon or so of water from a compressed air line during the working day. If this water and oil get through the spray gun onto the work, with the lacquer, they may cause blushing, slow drying and many other difficulties. Therefore, it is important to take suitable precautions to remove this moisture and oil before the air is used for spraying lacquer.

The separator must be carefully watched, however, to keep it functioning efficiently. Accu-

mulated oil and water should be drawn off frequently. A separator is not a cure-all and will not eliminate trouble unless given close attention. In fact, a neglected separator may cause more trouble than if none were used.

What Causes Blushing?

Whether the moisture is in the compressed air or in the free air surrounding the coated work, it causes blushing by precipitating the nitrocellulose or other ingredients in the lacquer. Nitrocellulose and water or oil are violent enemies when brought together in the same mixture. Only a small amount of oil and water is necessary to completely unbalance the solvent combination of the lacquer and cause separation of the nitrocellulose in a solid, grayish white form.

Blushing, due to high relative humidity in the drying atmosphere, is caused as follows: As the solvents from the freshly-applied lacquer coat evaporate they have a cooling effect upon the lacquer film and upon the atmosphere adjacent to the lacquer film, due to heat being absorbed from the air by the lacquer film to transfer the liquid solvents into the vapor form.

This is demonstrated by placing a little alcohol on the back of the hand. It takes heat to evaporate the alcohol, just as it takes heat to boil water. The heat is furnished by the skin and, as the alcohol evaporates, there is a sensation of coolness where the alcohol has been placed.

The Effect of Temperature

Air has a certain capacity for water vapor at a given temperature. As the temperature rises, the capacity is greatly increased and, as the temperature falls, the capacity is rapidly diminished. If the air contains a certain amount of water vapor at a given temperature, this amount is compared to the maximum amount which the air could hold at that temperature; this ratio is expressed in percentage as the relative humidity.

For example, if the air contains one-half as much water vapor, at a given temperature, as it can hold at that temperature, it is said to be 50 percent saturated, or it has a relative humidity of 50 percent. If it contains three-fourths as much water vapor at a given temperature as it can hold at that temperature, it has a relative humidity of 75 percent.

If air at a given temperature, has a relative humidity of 75 percent and that air is cooled a few degrees, its capacity for holding water vapor is greatly decreased; in other words, it becomes more nearly saturated with water vapor at the lower temperature than it was at the higher temperature. The relative humidity of the atmosphere increases greatly under such conditions, so that instead of having a relative humidity of 75 percent, as it had at the higher temperature, its relative humidity at the lower temperature may be 90, 95 or even 100 percent—or completely saturated with water vapor—if the temperature is lowered enough.

With this explanation it will be seen that in the process of lacquer solvents being evaporated from the freshly-applied lacquer film, the air immediately adjacent to the film will have its temperature lowered through giving up some of its heat to the lacquer film, to change the solvents from a liquid form to a vapor form.

THE PARADE OF COLOR

TALLY-HO!

IT IS not a mere coincidence that the man whose most enjoyable sport is the fox hunt or steeplechase should have colored furniture in his library or den. Neither is it surprising that he has lacquered suites and occasional pieces in other rooms of his home. . . . In responding to the appeal of color he reacts to an inborn love of variety and contrast in the things he comes into contact with daily. Lacquered furniture is one sure means of accomplishing this freedom from monotony. . . . Unfortunately, some manufacturers are working under the false impression that colored furniture is bought only by the middle classes. Hardly so, for Pat and Pierpont are very much alike

under the skin. . . . Tastes vary, of course. would be a dull, uninteresting world if they didn . . . Realizing this, we have developed a wi variety of rich, appealing shades and hues in Arcoz lacquer—colors that were created with the proble of home furnishings manufacturers constantly mind. . . . When may we show you the interesti results of these discoveries, and present the adva tages of the Arco color-creating service?

BUYING habits have changed. Only a few years ago, people bought in a leisurely, painstaking manner. Today, they buy hurriedly, ruled by their first impressions. . . . In this process, design, finish, and color play important parts because they are taken as evidence of quality and value. . . . The velvety, deep glowing finish and outstanding colors of Arcozon lacquer recommend it to manufacturers who desire to dominate present buying habits. . . . That Arcozon has been successful in accomplishing this is well supported by the fact that more and more furniture and household appliance builders are adopting it as a standard finishing method.

THE ARCO COMPANY, CLEVELAND, OHIO

Paints Varnishes Enamels Lacquers

ARCOZON

THE ARCO PYROXYLIN LACQUER SYSTEM

This lowering of the temperature will be accompanied by an increase in the relative humidity of the air directly adjacent to the lacquer film and, if the moisture content or relative humidity of the air is already high, the cooling effect may be great enough to cause the air to become saturated with water vapor, or even to pass the saturation point and to precipitate some of the water vapor in liquid form on the wet lacquer film.

Blush Retardents

These microscopic globules of water mix with the still liquid lacquer on the work and throw the nitrocellulose out of solution, or produce a blush. If higher boiling solvents, such as blush retardents, are used in the lacquer, blushing is retarded considerably, due to two factors.

First, the higher-boiling solvents are good solvents for nitrocellulose and, since they are slow evaporating, they remain in the wet lacquer film until the last and redissolve the nitrocellulose as fast as it is precipitated by the small globules of water.

Second, the slower evaporating solvents retard the rate of evaporation of the combined solvents in the lacquer film and consequently diminish the cooling effect upon the air directly next to the lacquer film, as the cooling effect is proportional to the rate of evaporation. This means that the air may not be cooled to the saturation point and no liquid water may be precipitated out of the air onto the lacquer film.

While blush retardents or high boiling solvents will retard blushing and actually prevent blushing if the relative humidity is not too high, these materials will not entirely eliminate blushing when the relative humidity of the air is very high. Under such abnormal conditions as 95 percent relative humidity, the use of a blush retardent would probably not prevent blushing.

Warmer Atmosphere

Where the conditions are so severe, there is only one other way to prevent blushing and that is to heat the atmosphere. By raising the temperature of the air a few degrees, its capacity for moisture vapor will be greatly increased or its relative humidity will be greatly reduced.

Consequently, the cooling effect of the evaporating solvents will not be great enough to cause the air directly adjacent to the film of lacquer to reach the saturation point and precipitate moisture on the work. Only a few degrees increase of temperature will lower the relative humidity from 95 percent to 60 or 65 percent, and eliminate the blushing.

Tumbling Lacquer

Practically any oil enamel may be tumbled successfully, but in many cases the procedure is expensive from a labor standpoint. Several coats are usually required and generally the enamel is baked between each application. Lacquer enamels, applied by tumbling, usually require fewer coats, and the baking is entirely done away with, since the tumbling lacquers are entirely air drying. It is claimed that tumbling lacquer covers extremely well in one coat, although a polish is usually applied afterward.

Sound investment and infinite patience will make money oftenest.

Stipple Finishing Metal Novelties

Describing the materials and methods used to produce the rough surface stipple effect; also methods of finishing and decorative treatment used to further enhance the striking effects produced.

By F. C. Overhauser

THE STIPPLING effect on metal novelties can be secured by two types of finishing materials. One is a stipple paste, which has been in use for several years to produce unique and pleasing effects on lighting fixtures, lamp bases, radio horns, candle sticks, novelties and all types of small decorative objects; and the other is a stipple lacquer.

Stipple Paste

Stipple paste is an oil or varnish type of material of heavy body or consistency, and is applied by brushing or spraying with a pressure tank spraying system. After the spraying or brushing operation, the roughened surface effects are produced by stippling the paste with a stiff fiber brush or crumpled-up cheesecloth or with a sponge. This stippling action should take place while the stipple paste is still wet.

If large stipples are wanted the stipple paste should be applied in thick consistency and the rough effect produced by a combination twisting and lifting motion of the brush or, whatever tool is used for stippling.

A fine smooth stipple effect can be produced by applying the stipple in a thinner coat. The stipple effect is then obtained by pouncing it with a large stiff-bristle brush or with crumpled-up cheesecloth. Where an extremely heavy coat is desired, the material can be applied with a putty knife and the stipple effect produced at the time of application.

Wooden Roller Method

Another system for applying the stipple paste to the surface, and at the same time producing the stipple effect, is by means of a wooden roller of the proper width to suit the work being done. The roller is first passed over a quantity of stipple paste spread out on a piece of glass or metal. When a sufficient quantity of the paste has adhered to its surface, the roller is run over the surface to be stippled; as a result a certain amount of paste will be deposited on the work. The stippling effect is obtained by the action of the roller being pulled away from the stipple paste.

Many Effects Possible

The variety of surface effects and colors possible are limited only by the versatility and ability of the man applying the material. Any effect from wrought iron to hammered gold, silver or brass can be imitated almost to perfection, according to how heavily the material is applied or according to the roughness of the surface left in the stipple after application. The uneven surface lends itself readily to high-lighting, antiquing, shading, frosting and blending in numerous color effects.

Preparation For Finish

After the desired roughened effect has been produced the paste should be allowed to dry over night, when it will become very hard. Sharp edges or raised stippled effects should be sanded off with moderately coarse sandpaper, using the sandpaper dry. For certain effects it may be desirable to leave the sharp edges and not use the sandpaper, but for most work it is better to smooth off the extremely sharp edges before the finishing operation is completed; this prevents them from being chipped off later through contact with other objects.

Stipple paste merely serves as a ground coat to produce the proper texture for the finishing coat. After drying and sanding, the desired shade of paint, varnish, lacquer enamel or lacquer bronzing coat can be applied over the stipple paste by spraying or brushing.

Finishing Processes

The usual method is to apply a coat of lacquer or bronze powder mixed with a clear bronzing lacquer. This serves as a base for the foundation color. The various colored effects are then produced by applying the harmonizing or contrasting colors ground in oil or japan, and wiping these off before they dry so as to show the base color on the raised portions and to show the contrasting colors in the depressions.

Another method frequently used is to apply contrasting colors by spraying, holding the spray gun at an angle so that only certain portions of the work receive the contrasting color, while the base color is shown on other portions of the work.

Stipple Lacquer

The second type of material used for producing the stippled effect is stipple lacquer. This type of material is made from a nitrocellulose or lacquer base in such a manner as to have little flowing properties after application. It cannot be brushed or knifed on but must be applied by spraying, using a moderately large opening in the nozzle of the spray gun with a pressure-feed container. No reduction of the material is required before application; otherwise the non-flowing properties which give the stippled effect would be lost.

Method of Application

In applying stipple lacquers, a spray gun with the low air pressure of 15 to 20-lbs., should be used on the nozzle of the gun, while the pressure used in the pressure tank should be increased to 15 or 20-lbs. Care must be taken not to atomize the stipple lacquer too finely or the stipple effect will be lost. It is advisable to shut off the air from the horns of the gun so the stipple lacquer flows in a round stream rather than in a stream that is fan shaped.

The use of low air pressure at the nozzle of the gun and high air pressure on the material in the tank allows the stipple lacquer to be forced out in little chunks which are not atomized or broken up before they strike the surface. Various sizes of stipple can be produced by regulating the quantity of material flowing through the nozzle, the air pressure, the distance of the spray gun from the work and the amount of material applied. It is not possible to get as large designs with the stipple lacquer as with stipple paste.

If stipple lacquer is used it

should be allowed to dry at least an hour, or preferably longer, before further operations. No sanding should be done on the stipple lacquer. The succeeding coats of bronze powder, paint, varnish or lacquer enamel can be applied in the regular way; high-lighting or shading can be accomplished by the same methods used on stipple paste.

Either the stipple paste or the stipple lacquer can be applied directly to the work without any primer underneath, although for some types of work a little better adhesion would be possible if a satisfactory primer were first applied.

Removing Stain from Marble

Continuing the study of means for removing various kinds of stains from marble work, the Bureau of Standards, Department of Commerce, has developed methods of removing oil stains, copper stains, fire stains, wood stains, and the common service stains sometimes called the "yellowing" of marble.

Linseed oil and lubricating oil stains may be removed by a mixture of acetone and anyl acetate. Old oil stains which have turned yellow can sometimes be effectively bleached with hydrogen peroxide. Copper stains from bronze statuary on marble pedestals may be removed by a poultice made of powdered talc, ammonium chloride and aqua ammonia.

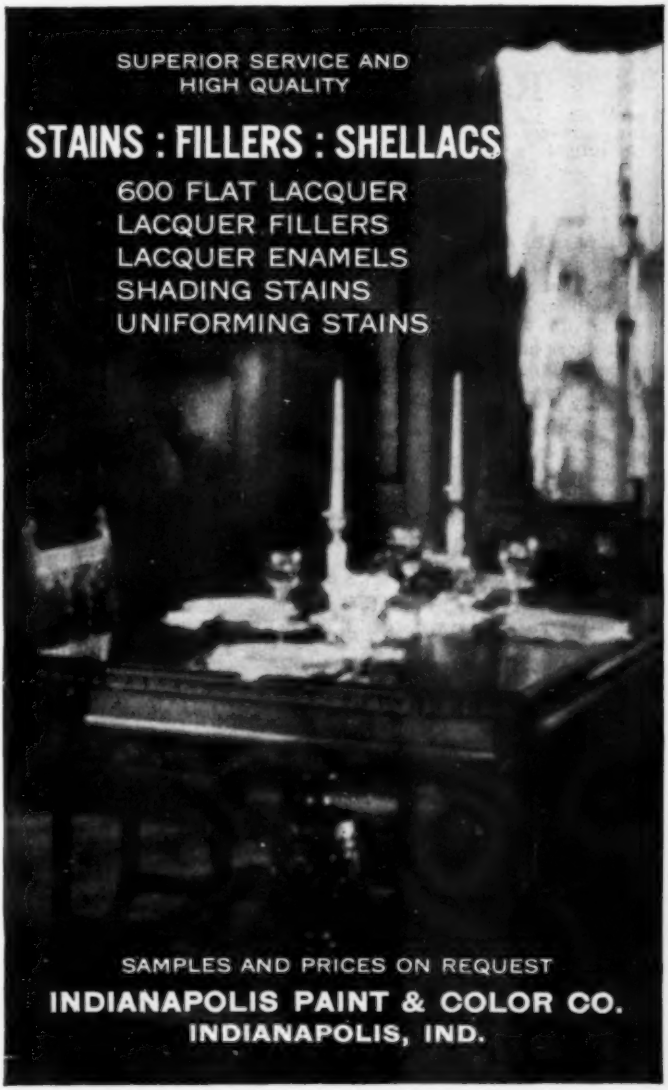
Fire stains, due to pine wood burning in contact with the marble, can usually be removed with a mixture of trisodium phosphate solution and chlorinated lime, by keeping a layer of saturated cotton over the stain for several days.

General service stains, which are usually an accumulation of various kinds of discolorations on marble that has not been maintained in a proper state of cleanliness, can usually be removed by applying a poultice of powdered talc reduced to a pasty consistency with the trisodium phosphate and chlorinated lime solution.

In treating stains on marble, the active solvent is usually applied either in the form of a poultice, by mixing it with an inert powdered material, or by placing over the stain, a layer of cotton saturated with the solvent. In the case of very volatile solvents, the saturated cotton may be covered with a scrap slab of marble.—*Improvement.*

Let us all cease to worship the false god of volume only, and realize that to turn down the last unprofitable five percent of volume is not only good business practice but mere common sense; then if there are some people in every line who are so big that they want to grow even bigger in volume only, and thus enter the charity business, let them get the unprofitable orders.

T. B. Colby, manager of Berry Brothers' aviation division, and his new ship, a Buhl Jr., Airsedan equipped with Whirlwind motor. The wings and tail surfaces are International orange with Vought blue fuselage and Waco maize panel on the sides. The plane has a top speed of 140 miles per hour and cruises 115 or 120. This is Mr. Colby's third airplane. As was the case with the previous two ships, it will be used to maintain contact with Berry Brothers' customers.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INDIANAPOLIS, IND.

Racks for Odd Size Articles—Rapid Spray Finishing

Citing instances wherein racks were designed to hold certain articles in suitable position for completely spraying several units at a time thereby lowering production costs

By Donald A. Hampson

SOME MANUFACTURERS make such a variety of parts and products that one may see practically all of the conventional methods of coating in a single plant; others specialize to the extent that a single mode of finishing is all they use from one year to the next.

The same drastic limits may apply in the matter of size—and of quantity. For example, the finishing work may be chairs or caskets—that are put into a spray booth singly. The other extreme in size might be novelties that could be dipped more effectively.

Between these extremes lie the "big little" pieces, or the "little big" pieces, if you prefer. These must be handled singly but coated collectively. They are troublesome and costly parts to finish, unless a satisfactory scheme of racking is devised, or unless some other way is found to overcome the handicap of their being "just too large" to work through with the small parts, and too small to handle individually with the big ones.

Handling Small Pieces Effectively

Simple arrangements for some of these jobs will be reviewed, two in particular being in widely separated fields, but involving much the same handling characteristics

In one division of a furniture manufacturing company, bedroom suites are made exclusively. Some of the articles are sprayed when completed; others are sprayed while they are in the form of parts, such as bed sides and dresser tops. One dresser top piece is 36-in. long and 6-in. high. This top piece has a double-kidney wave along the upper edge and a moulded form is cut over the entire curved part. This shaped edge and the front face are the parts to be finished in mahogany, or some other finish.

These dresser parts come to the spray booth carefully racked. The racks are really wooden trays that have end pieces with two series of notches in them—a set of high notches and a set of low ones. Round iron rods ¼-in. in diameter are laid in the notches and the pieces are tilted against these rods. Depending upon the size of parts being finished, the rods may be placed in the high or in the low set of notches, thereby allowing the parts to be adjusted in position like a Morris chair.

Spacing also can be varied by skipping one or more notches. As a result these articles, or any other similar pieces laid on the rack, can be positioner at such an angle that the entire surface can be sprayed without shifting the article. The rods are inexpensive, readily set and easily cleaned.

Proper Racking Speeds Spraying

As the drawing in Fig. 1 shows, it is possible for the spray operator to start at one end of a full rack

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and work over the entire load without changing the position of a single article. The rack is easily

Fig. 1—End view of parts leaning against slender iron rods, the arrangement being such as to make it possible to spray several pieces at a time.

made and is adaptable to a considerable variety of parts.

Steel shelving of miscellaneous sizes is coated in a somewhat similar manner at one factory. The shelves average 18-in. in width and they are in random lengths up to 4-ft. in length. The long edges are bent over to right angles, as shown in Fig. 2.

A stationary table is placed in the booth. The table top is sheet metal and on it are small blocks of wood which raise one edge of each shelf, as illustrated in Fig. 2. According to the size of shelving, three or more pieces are put on the rack at a time. They must

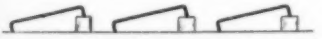

Fig. 2—Pressed steel shelving racked to allow the spray operator to "shoot" several pieces at a time.

be separated to a certain extent in order to permit the spray operator to spray the turned-down edges.

Setting up each load is a quick job, after the layout has been arranged for a particular size. The operator starts at the front and "works into the booth", covering each piece in succession.

With a little systematizing, it is possible to make fast time on small lots, and on those pieces which do not fall into any definite volume-production class. Having planned the layout, and proved its workability, the final step is for the foreman to follow it up day by day; to his energy and watchfulness is due its success or failure.

Clean-out Valves for Compressed Air Line

It has been my experience that the main air-line pipe, through which air passes from the compressor to the spray booths or other pneumatic machinery, frequently becomes more or less corroded or rusted on the inside. When the inside of the pipe is in this condition, every little jar or knock loosens some of this rust. In time this loose rust, along with other sediment that perhaps has accumulated within the pipe, will interfere with the free passage of air.

This sediment will eventually clog the filter screens at the oil and water separator intake, causing a noticeable drop in pressure when the spray-gun trigger is pressed. In other words, when the adjustable air pressure gauge is set to deliver a pressure of 50-lbs. and if the pressure gauge shows a drop in pressure of from 10 to 20-lbs. when the spray gun trigger is pressed, it is a probable indication that the pipes are dirty.

To remedy this condition, it is necessary to disconnect the main air line at the separator intake (while the air compressor is stopped, of course) and then, after the pipes have been disconnected, start the compressor and allow the air to blow through the pipes so as to clean them of all loose sediment.

This is a somewhat expensive operation, as it consumes considerable time. Then too, all air-using machinery must be idle while this work is being done.

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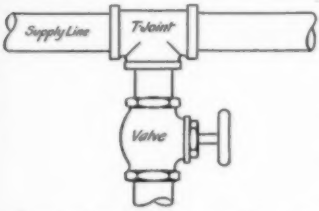
All this time and labor can be saved by inserting one or more T-joints in the main air line, preferably at the points where the pipe makes a sharp turn (after the turn). The T-joint is positioned so its opening points down and a valve is attached, as shown in the



Showing how a clean-out valve is inserted in the main supply line which delivers compressed air to finishing equipment.

accompanying drawing. To insert the T-joint in the air line, it is not always necessary to cut the pipe. A sleeve, which connects the different lengths of pipe together, may be removed and replaced with the T-joint.

Two such T-joints (with valves attached) placed in the main air line, cost very little but they help wonderfully in increasing the efficiency of the compressed-air system. To clean the piping so equipped, it is only necessary to open the valves and allow all the dirt to blow out. This can be done at any time without stopping any machinery. The valves should be placed at a convenient height, of course, so as to be easily accessible at any time. These clean-out valves can also be used to release accumulations of oil and condensation from within the pipes.—George Ladermann.

Fatigue is related to workroom morale, which in turn is dependent in part on cheerful lighting.

Best Location for Air Compressor

Two plants I know of have the air compressor located on the first floor, while the finishing is done on the floor above, and this arrangement has worked successfully in these two plants. One is a woodworking plant and the other is turning out metal goods.

As all machinery, presses, and the shafting are on the lower floor, the oiling is looked after by the same men who oil the other machines. It places the maintenance and inspection where it properly belongs, and saves the spray department the work of attending to this equipment.

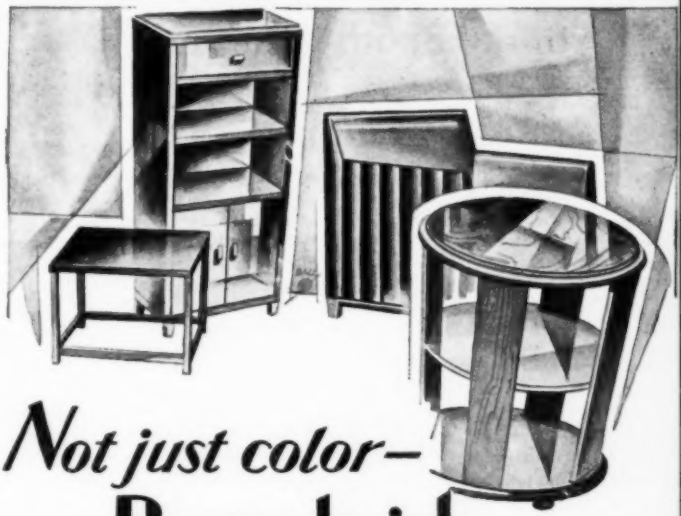
Another and more important advantage, is the tendency of the water (condensed in the piping system) to drain down to the bottom of the compressor tank, so that when the valve is opened at the bottom of the tank, the water is blown off at one operation from the whole system.

Both these plants have standard filters and equipment and, in damp rainy, weather or very humid days, the above arrangement takes care of the greater part of excess moisture in the air supply.—Platt.

Proximate analyses of a number of stick-lacs of various origins show that the moisture content varied from 1.0 to 6.1 percent, the average being 2.9 percent.

Milburn Issues New Loose-leaf Folder

Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md., is sending out a new 4-page 8x11-in. folder which describes and illustrates new spray guns, siphon-feed containers, pressure containers, air purifiers, compressor units, hose, fittings and portable finishing outfits.



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Spray Booth Cleanliness

Practical finisher tells why spray booths should be clean and explains in detail how to clean them and what to use to keep them clean

By Geo. S. Paine

THE day when three or four men spent several hours cleaning the mussy mass of varnish from the spray booth has passed; it has given way to new methods of industrial house-keeping. A clean spray booth materially reduces fire risk, adds tidiness to the finishing floor and cleanliness to the product.

I have always noticed that, to visitors of the finishing department, the spraying operations attract more attention than anything else; spray booths are important show places in the department. Sometimes their condition is very embarrassing to the foreman. New methods, however, have substantially cut down the time required to keep spray booths clean.

Wrapping Paper as Lining

If a coat of hard oil* is applied to the inside of the varnish booth, with a brush or other suitable means, and then overlaid with paper (not too heavy), the paper will adhere to the walls and top of the booth snugly, yet it can be easily removed and replaced. This covering will hold quite a load of refuse.

Cleanliness is always attractive and impressive.

The booth should be reasonably clean to insure adhesion of the grease. No cleats or tacking is necessary; the paper can be started at the floor on one side and carried up that side, across the ceiling and down the other side. In the back of the booth, the paper can be laid over the exhaust openings, then quickly outlined and cut away with a knife. In lapping the paper, smear some of the grease down the edge and it will stick. A wide, filler brush will help to smooth the paper down; really the operation is like papering a wall. One man can easily do the work in a short time.

Taking an 8-ft. booth as a standard, the entire operation of removing the old paper and putting up new paper will take approximately an hour and a quarter. The amount of hard oil used for the initial greasing will run about 10 to 15-lbs., but it will be less on subsequent greasing, as the old grease need not be removed.

For floor covering, heavier paper might be desirable, depending upon the length of time between cleaning and the amount of wear to which it is subjected. In a woodworking factory, the sand-

*Regular spray booth coatings, which are effective and economical are available for this purpose.

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Murphy Waterproof Mixing is not a substitute for shellac and should not be used clear. You mix it with shellac —equal parts of each up to two parts shellac and one Waterproof Mixing — according to the job. The mixture is applied the same as ordinary shellac.

Read over the list of advantages once more, bear in mind the company behind this product, and order a quantity for trial in your plant.

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paper from triple-drum sanders makes a substantial covering, or the floor may be treated with paraffin, as suggested farther on for lacquer, if the floor is to be cleaned each evening.

Coating with Paraffin

Another method, especially applicable where lacquer is used, is to spray from a cup gun, a thin coat of melted paraffin over the clean booth and floor. The application should not be heavy enough to run.

This method necessitates scraping the booth to clean it, then recoating the surfaces with paraffin, but this is not such a difficult task as it may seem. If the paraffined floor becomes dry from being walked on, and then gets covered with lacquer, a little lacquer thinner may be sprinkled over the spot after the scraping operation; then a little scrubbing with a broom or mop will clean it up nicely. The cleaning operation may be completed with lye-water and a mop. Recoat with paraffin the first thing in the morning.

Precautions in Cleaning

In cleaning the walls or floors *do not use steel scrapers*, as friction on the booth metal, or the accidental striking of a nail or rivet head may cause a spark that would ignite the combustible refuse in the booth and cause a disastrous fire. Brass is a suitable metal from which to make the cleaning tools.

Handy Wall Scraper

For a wall scraper, a handy tool is a piece of brass 8-in. long and 4-in. wide, sharpened on one edge and one end. A strip of wood fastened across the unsharpened edge will make the handling of this tool easy and comfortable. This tool will clean an 8-in. strip at one broadside sweep; the sharpened end (4-in. across) is suggested for cleaning out depressions passed over by the wider edge. For the floor, a 4-in. piece of moderately-heavy brass, sharpened and attached to a 6-ft. handle, is convenient.

Clean spray booths always look inviting and they are safer.

How Long It Takes

The time required to scrape an 8-ft. booth clean, scraping sides, ceiling and floor, is from 1 to 1½ hrs. Where the coating is very light, a cloth moistened with lacquer solvent will clean the booth more quickly than a scraper. The time required to clean the floor only—which should be done every night—will range from 20 to 30 minutes.

Further Precautions

Going over the outside of the booth occasionally with an oiled rag will improve its outward appearance, and will cause it to catch and hold much of the dust that otherwise would be drawn toward the exhaust fans passing enroute over the surfaces being finished.

Regardless of how clean a finisher keeps his spray booth, he should always keep a clear path to that fire extinguisher hanging near

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the booth; it too, is a precaution not to be overlooked. Safety matches are the only ones that should ever be permitted in the finishing room, and even these should never be lighted in the building.

Satisfactory Sandpapering

First class sandpapering of an article in the white (in wood) is as important as the final finish. Many jobs are spoiled by improper sanding. Care should be exercised to avoid using too coarse sandpaper, because it will dig and scratch and leave an unsightly surface on the wood or paint. Then too, sandpaper that has become clogged or "gummed up" should be avoided, as this is unsatisfactory and wasteful of labor.

Cross sanding (across the grain of wood) is a common fault, and this is sure to show in the finished work. It often happens, too, that short strokes of the sandpaper will leave circular scratches at the end of each stroke, where the paper stops.

Some bosses seem to think that anyone can do sanding, but there is only one man in a dozen who will stick to the game in an attempt to learn more about the art. I have seen men come and go, taking the foreman's time and causing costly repair work because of improper sanding, whereas, if the concern had paid more wages and obtained higher class men, this waste would have been eliminated.

A few experienced men will do the work of a dozen cheap men —men who are here today and gone tomorrow. If a foreman picks his men with care and tries to keep them going all the time, he can usually get his work done without hiring a lot of inexperienced men during the rush season. If care is not exercised, many dollars worth of sandpaper will be thrown into the waste can —due to men throwing away incompletely used sandpaper.

Sandpaper should always be cut in square sheets; not in haphazard odd sizes. A thin, double-faced paper will do more and better work than a stiff paper that cannot be worked into the corners or around mouldings, etc. Good sandpapering makes a good final finish, if properly used.—J. K. Cooper.

Light sanding with fine sandpaper after the application of stain or shellac.

Air flights in the United States today are said to average 25,000 miles for every 24 hours.

Explosion Proof Equipment

Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, Ill., is sending out its illustrated, descriptive Bulletin "G-28", which gives complete information on the new air-finishing booths equipped with explosion-proof ventilating units, as recently developed by the company.

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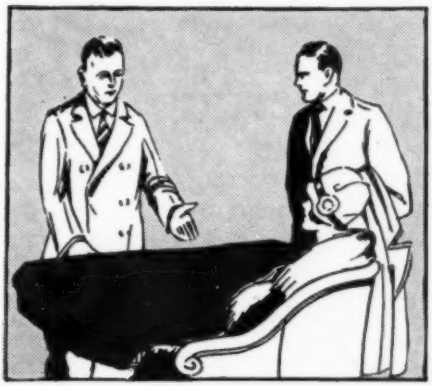

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Wood Stains and Their Uses

Enumerating certain characteristics of acid stains, aniline stains, water stains and spirit stains for use in modern wood finishing, with suggestions on how to use them

By C. Dan Youngs

WOOD STAINS and their uses in industrial finishing departments today are widely varied. While there are few finishers left who mix their own stains, yet there are some who have survived from the old days when this was common practice. In fact, it used to be the case that no man was considered a wood finisher unless he was able to mix and match any stain that might be required.

Today, it is different. The higher cost of labor, the improbability of matching two batches identically alike and the fact that ready-mixed stains can be purchased from nearly all manufacturers—these factors have turned most finishers to the use of manufactured "ready-to-use" stains.

Where stains are still mixed in the shop, there are some points which must be carefully watched. If an oil stain is desired, the fineness of the grinding of the oil colors is important, as an oil color heavily extended with inerts, such as barytes, silica, etc., is likely to cloud or partially cover and hide the grain of the wood. In this case it is no economy to purchase any but the best grade of oil colors. Only such oil colors as are fairly transparent should be used in making stains, inasmuch as the colors possessing hiding power of themselves, will hide the wood grain.

Acid Stains

Acid stains also, are difficult to mix in the shop, and they involve an element of danger to the workman. Where muriatic, sulphuric and other acids are used, care must be exercised to avoid burning the skin or clothing. For this reason, rubber gloves and a rubber apron should be used; even with this protection, a moment of carelessness may mean serious injury. Really, no valid reason exists for mixing acid stains in an industrial finishing room, as they can be readily procured at reasonable cost from most manufacturers.

One advantage that acid stains have over oil stains is their quickness of setting—and the increased production speed that is possible because of this fact. Where an oil stain is used it is generally necessary, or at any rate desirable, to allow at least overnight for drying before applying the next coat. This, of course, is not the case with acid stains. Then too, with most acid stains, clearer tones and more brilliant colors can be obtained than from certain oil stains made with earth pigments.

Oil stains can be made more penetrating by the addition of benzol to the mix. Open-grained woods require about one-half the amount that should be used for close-grained woods, which is about one pint to a one gallon mix.

Aniline Stains

There is a somewhat widespread use of aniline stains. Aniline colors, of course, are coal-tar derivatives, and are made of various products distilled either from oils lighter than water, called crude

naptha, or of oils heavier than water called creosote. For stains or dyes, these are divided into four classes:

1—Those soluble in alcohol and water;
2—Those soluble in water only;
3—Those soluble in alcohol only;
4—Those soluble in oil.

In the first class are found magenta, methylene blue, picric acid, malachite green, Bismarck brown, napthol yellow, the eosins, methyl violet and a great many others in common use.

The second class contains fast red, ponceau, brilliant blue, azo-blue, nigrosine, fast and acid browns, methyl orange, brilliant scarlet, as well as many others.

The third group has among its number some in common use, namely; aurine, malachite green base, spirit-soluble nigrosine, spirit blue and brilliant black.

Among the fourth group may be found rose-aniline base, oil yellow, oil violet, oil brown, oil orange, oil scarlet, oil green and oil crimson.

As a matter of actual practice, few of the above are used in finishing shops. If they are, a chemical laboratory should be maintained in connection to enable the finisher to see that colors of equal strength and tone are furnished. The manufacturer of finishes, however, has these things to contend with in making stains.

Of course, these colors all have differing qualities of fastness to light and permanence, and it is impossible to go into this phase of the subject in this article. It is only necessary to emphasize the fact that trouble arising from the use of aniline colors in making stains can be avoided if the stains are purchased ready-mixed from the manufacturer.

Water Stains

Another class of stains much in use, includes water stains. The principal objection to these is their faculty for raising the grain of the wood, thus requiring extra sanding. As the name signifies, these are made from a mixture of water and water-soluble pigments. These pigments are usually water-soluble anilines such as Bismarck brown, nigrosine, red alizarine and several others.

The Bismarck brown is used for making walnut; the nigrosine is for antique oak and ebony, while alizarine red and a little Bismarck brown makes a beautiful mahogany. About 4-oz. of the powder mixed with 3 gallons of boiling water and a little over a pint of vinegar makes a stain such as is ordinarily used.

Spirit Stains

Spirit stains are harder to handle than oil stains, as they are much quicker acting and more penetrating. They are mixed with spirit-soluble anilines dissolved in hot denatured alcohol. This mixing is dangerous over an open fire, so the alcohol is heated in a pot placed in boiling water.

Use of Stains

In using stains, one finds a great difference in the kinds of wood to be stained. Sometimes it is difficult to get an even stain on the same kind of wood, due to the difference in the grain, or because of sap or pitchy places. If water stains are used, it is better to wet the wood first with water and then sand down the raised grain.

Using too much water stain at one time may warp the wood, so it is better to use several coats to obtain a uniform finish, than to use one heavy coat. Each coat.

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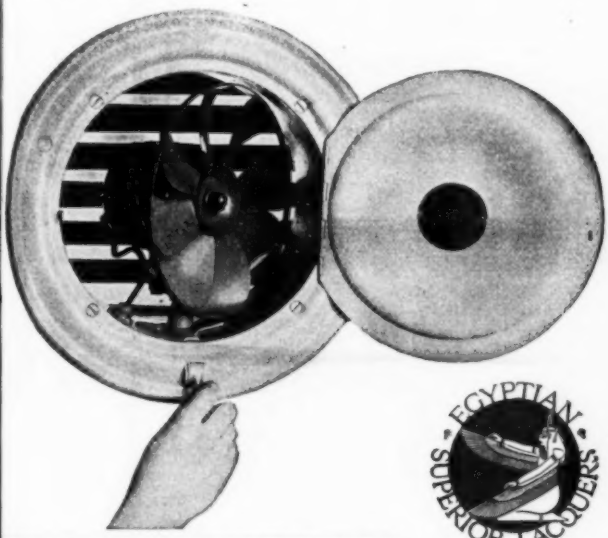

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however, should be thoroughly dry before the subsequent coat is applied. On most woods, the use of warm water is preferable because of its better penetration.

Oil stains do not penetrate as deeply as water or spirit stains, so their brushing is much easier. And, as they are slower setting, they can be wiped to a uniform finish after being allowed to dry for 15 minutes or more. Where time permits, some finishers claim that it is perhaps better and safer to use oil stains than any of the others. Possibly their use is more universal and their application is more widely understood among finishers.

Since some of the aniline stains, especially the reds, "bleed" it is always safer to follow the filler coat with a heavy coat of shellac. The reputable paint manufacturers today, however, guard against this in every way possible by using non-bleeding colors wherever it can be done.

Method of Application

The application of stains is usually with a broad brush, about 4-in. wide, except in the case of water stains where better results can be obtained through use of a sponge. The brush should not be saturated, nor the stain flowed on and then brushed out. After a little, the finisher learns by experience just the right amount of material to carry, and the right stroke to use; no set rules can be given.

It is well to remember, however, that the same stain will not give the same finish on different woods. A stain that works out to the desired color on white pine, will not match when used on oak and birch; the match is made with oil stains in the application and the wiping.

The use of stains is common, which is well, for to an eye trained to perceive the beautiful, there can be no comparison between the grain Nature gives the wood itself and the same piece of furniture when covered and obscured with opaque finishes.

An analysis made by one of the economic services shows that 35 percent of all business failures are due to incompetence, 33 percent to lack of capital—also a form of incompetence—17 percent to specific conditions, 4 percent to fraud and only 1.8 to competition.

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Finishing Philippine Mahogany

Recommending methods of preparing wood surfaces in the white and suggesting the methods, kinds of materials to use and drying time to allow for staining, filling, shellacing—to avoid formation of pinholes

By R. L. Masterson

THE CABINET wood generally referred to as Philippine mahogany is somewhat more porous, and contains larger but more shallow pores, than certain other mahoganies, consequently it requires special attention in finishing to avoid the development of pinholes, shrinkage, and other defects. This mahogany, however, possesses a good figure and can be finished satisfactorily if proper methods are used.

Preparation of Surface

The first step is to sponge the surface with clear warm water to raise the loose fibers. Sometimes a thin glue-size is used for this purpose, this glue-size being of a solution of 2 to 4-oz. of animal glue to a gallon of hot water. Some finishers claim that even this small quantity of glue on the surface is likely to be dissolved or washed off by succeeding coats of stain, and that it often produces a murky or muddy finish.

When clear water or very thin glue-size is used, the mahogany should be allowed to stand overnight before anything further is done, for if the excess moisture on the surface of the wood is not completely evaporated, the sponging operation will be of little value. At the end of the drying period it is necessary to cut down the raised and stiffened fibers with sharp, fine sandpaper. The sandpaper must be sharp in order to cut the fibers clean and not merely wear them off by friction; it must be fine so it will not cut deeply enough to loosen up any appreciable quantity of new fibers.

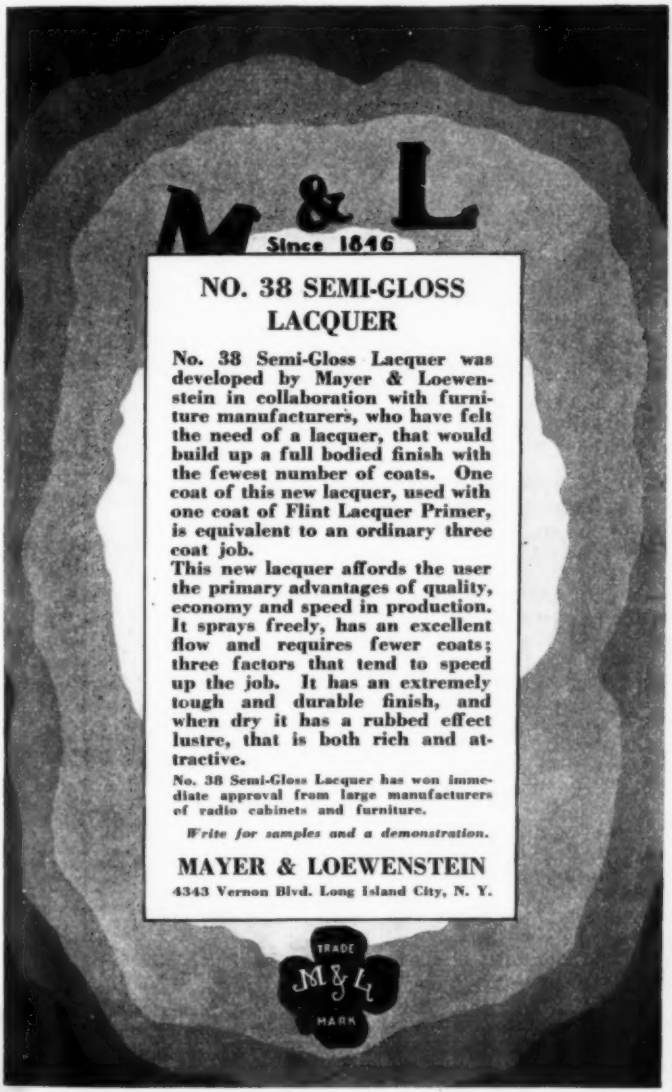
The Staining Operation

After sanding has been completed, the wood surfaces should be stained. Really staining should immediately follow sanding, for if the wood is allowed to stand very long after sanding it will absorb additional moisture from the air and new fibers will be raised.

Use Water Stain

Water stain should be used for staining Philippine mahogany. This stain gives a clear uniform shade, whereas many oil stains strike too deeply into the porous parts of the wood and may give it a muddy, murky appearance. The water stain used should be weaker for Philippine mahogany than for African or Central American mahogany.

After the water stain has dried at least overnight the next application of material recommended is white shellac, made by mixing one part of 4-lb. cut shellac with eight parts of denatured alcohol. This should be allowed to dry for five hours. This coat stiffens the fibers without disturbing the color or stain underneath.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What Causes Pinholes

It is during the filling operation on this kind of mahogany that the greatest care must be taken to avoid the development of pinholes, for some of the pores are connected by U-shaped channels below the surface of the wood; although the two openings of such pores may be apparently filled with the filler, a quantity of air is entrapped in the lower portion of the pore.

A change of temperature will cause expansion and may form an opening around the filler in one of the pores thus closed. When the finishing material is applied it runs down into the open pore, forces out some of the entrapped air, and forms a pinhole.

Filler Coats

Still other pores in Philippine mahogany are very long, giving more or less the appearance of a groove rather than a pore. Such pores are difficult to fill because of the danger of wiping the filler from them when the excess filler is wiped off. As a rule, the paste wood-filler used on Philippine mahogany should be heavier than for other types of wood and, if it is applied with a brush, it should be brushed or rubbed well into the pores.

Some finishers find it is advantageous to fill twice, or double fill. First, they use a very thin coat of filler which will run down into the pores freely; then they follow with a heavier fill next day for the second filling. The filler must be carefully wiped off, being particularly careful not to disturb the filler in the pores any more than is necessary.

Each coat of filler should be allowed to dry at least 24 hours; in fact, it is preferable that the second coat (where two are used, or the one coat of filler, where only one is used) dry 48 hours.

Use of Shellac

Often a coat of shellac is used over the filler. This is permissible, if it is not used in proportions heavier than about 2-lbs. of shellac to the gallon of alcohol. Such a shellac coat should be sanded before the first coat of varnish or lacquer is applied.

Where pinholing is being experienced in connection with the use of varnish on Philippine mahogany, it may help to thin the first coat of varnish somewhat with turpentine, to help it in flowing down into any unfilled pores and seal them. The very nature of Philippine mahogany demands that every precaution should be taken in the sanding, staining, filling and other finishing operations, if a good serviceable finish is expected. Likewise, it is just as important on Philippine mahogany, as on any other of the more expensive woods, to give plenty of time for the stain, filler, shellac and lacquer coats to dry.

Booklet Features Syphon-Ventilated Cabinet

The Grand Rapids Blow Pipe and Dust Arrester Co., of Grand Rapids, Mich., is sending out a new 12-page booklet which describes and illustrates all parts and accessories to the Newcomb syphon-ventilated cabinet or spray booth for use in industrial finishing departments.

New Supply and Equipment Catalog

Geo. E. Watson Co., 164 W. Lake St., Chicago, dealer in finishes, finishing tools and supplies, is distributing a new catalog No. 49, which contains 116 pages size 10-in., describing, illustrating and giving prices on its varied line of merchandise.

Devoted to—
Questions
Answers
Suggestions
Comments and
Discussions on
Specific Problems

Questions and Answers

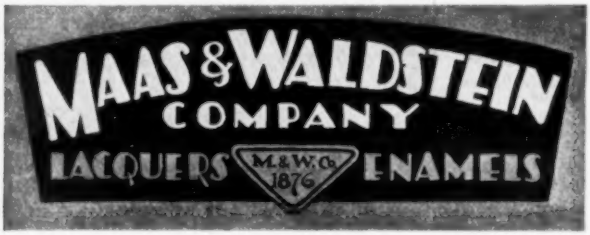
Information Service

Every issue of *Industrial Finishing* contains a wealth of practical information on various subjects of interest to users of finishes and finishing equipment, but from time to time new problems and questions arise, which demand prompt and authentic information. *Industrial Finishing* is in position to service inquiries, and the editor invites all individuals and concerns in the industry to make known their wants. Every effort will be made to supply the information desired, at no cost to you.

Questions are invited in regard to:

Finishing-room troubles or problems;
Where to obtain certain materials, supplies or equipment;
What methods or materials to use for certain results.

Additional comments or suggestions regarding questions, answers or articles appearing in this section, are invited.



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Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Finishes to Imitate Metal Plating

The major finishes from the plating room for ornamental goods are gold, silver and nickel. Suppose we take these in polished form; is there any means in use today by which a sprayed finish can be made to approximately resemble them, and be handled on a production basis?—Platt.

There is no means in use today, so far as I know, by which a sprayed finish can be made to approximately resemble polished gold, silver and nickel-plated work. The closest approximation to these plated finishes can be obtained by mixing very finely divided bronze powders, known as lining or striping bronze powders, of the desired shade with a clear bronzing lacquer and applying this coat by spraying directly on bare metal. After this coat is dry, a coat of pale colored, high gloss, clear lacquer can be applied to give the luster of polished work.—Chas. Blanford.

Toilet Seat Finishing Rough Shellaced Surface

We manufacture toilet seats. On oak we find that after the seats are dipped in shellac, they are very rough. When the room temperature is 80-deg. F., the hydrometer in test will read 31. Is our shellac cut too thin? The wood grain raises quite a bit, but I find that when shellac is brushed on, the surface is much smoother. When these seats are filled they are dipped in, and the filler is quite heavy. The seats stand overnight before the shellac is put on. After the filler is wiped off the seats seem to be smooth. —W. H. W.

Your oak toilet seats are rough after being dipped in shellac because the shellac raises the loose fibers of the wood and stiffens them as the shellac dries. All shellac contains denatured alcohol and all denatured alcohol contains water. The highest proof alcohol contains between 5 and 10 percent of water, and much of the commercial alcohol contains as high as 20 to 25 percent of water. It is this water that raises the loose fibers of the wood and the shellac stiffens these raised fibers as it dries.

Your work is smoother when the shellac is brushed on because the brush levels down some of the fibers raised by the water in the alcohol; and the shellac sets and holds these fibers down.

The proper way to get rid of this rough condition, if a stain is used, is as follows:

1—Sand the bare wood smooth. Some finishers sponge the wood with warm water the night before sanding in order to raise the loose fibers. At times a small amount of liquid glue is added to

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Being the final operation, and first seen, your finish is most important. It makes or breaks the product upon which your reputation hinges. Don't risk it. It isn't worth it to take a chance, and what's more it isn't necessary.

Your reputation is safe with Stille's Guaranteed Shellac. It will strengthen your good will, speed up your turnover and increase your volume of repeat sales.

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this sponging water to stiffen the raised fibers.

2—If a stain is used, apply this next and let it dry.

3—After the stain is dry, apply a thin coat of shellac reduced at the rate of 7 or 8 gallons of 190-proof denatured alcohol to one gallon of 4-lb., cut pure white shellac.

4—Sand the wash coat of shellac to a smooth surface.

5—Fill with paste wood filler and, after this is dry, finish with shellac, varnish or lacquer.

Where the color is imparted to the wood by the filler and no stain is used, the wash coat of shellac referred to above cannot be used as it would seal the wood and prevent the filler from staining the wood. In this case extra care must be taken in the sanding of the bare wood, as per operation No. 1 above.

Instead of using shellac over the filler, why not use a coat of lacquer or varnish? There is no water in lacquer solvents or in varnish solvents, consequently they will not raise the grain of the wood like shellac.—C. F. Merrifield.

Chestnut Breakfast Tables in Silver Gray

We would be very grateful for explicit instructions about finishing chestnut breakfast tables and chairs in "silver gray."—F. C. W. and Co.

There are two methods in common use for producing a "silver gray" finish on chestnut breakfast tables and chairs. One system makes use of a silver-gray acid stain to color the wood, whereas a gray lacquer is used as the first coat in the other system. The stain method of finishing allows a

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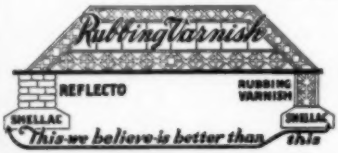

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RELIANCE VARNISH CO., Inc.
Louisville, Ky.

part of the flake or hard portions of the wood to be seen through the stain, due to the hard portions not absorbing as much stain as the softer parts.

The lacquer system gives a uniform color to the entire surface of the wood due to the fact that the lacquer remains on top of the wood and is not absorbed to any great extent by the wood.

A typical schedule for the stain methods follows:

1—Silver-gray acid stain applied by spraying, brushing or dipping. Air dried overnight

2—Wash coat of shellac, lacquer, substitute shellac or lacquer primer to stiffen the fibers of the wood raised by the stain. This coat should be very thin. Air dry about 5 hours.

3—Sand work smooth.

4—Fill the pores with white paste wood filler, reduced with naphtha to a creamy consistency. This should be brushed on and, after standing about 15 minutes, it should be wiped off across the grain of the wood, leaving the white filler in the pores and the silver-gray stain between the pores; then air dry overnight.

5—One coat of shellac, clear lacquer, flat lacquer, clear varnish or flat varnish. If more body is desired, apply more than one coat. Shellac or lacquer is usually used in preference to varnish as the finish coat.

6—If desired, a coat of liquid or paste wax can be applied and polished, although this operation is not necessary and is seldom used today.

The schedule for a typical lacquer method follows:

1—Gray lacquer enamel of the proper shade, applied by spraying. Air dry two hours.

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DAY'S Tumbling Lacquers, in clear, opaque or transparent colored finishes give a result equal to that obtained by spray or dip—at half the labor cost. We'll be glad to tumble a peck of your turnings free to show the fine result you yourself can obtain. You will like the result and the reduced cost.

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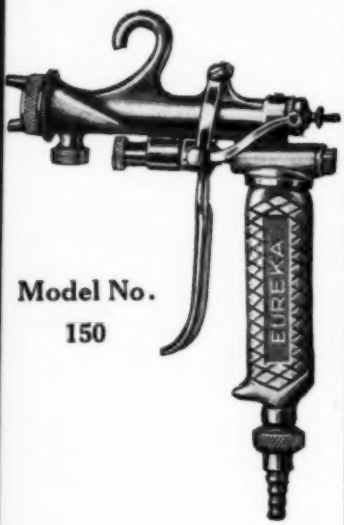

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We will be pleased to discuss your Spraying problems with you and invite you to write us regarding your difficulties.

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2—White paste wood filler, used as outlined above under stain method.

3—Clear gloss or flat lacquer, applied by spraying as outlined above the stain method.

4—Wax if desired.

It will be seen that the lacquer method is shorter than the stain method, but the results will not be a true "silver gray" finish, as it has been known for years. The lacquer method will give a close imitation of the old "silver gray" finish. The above schedules can be still further shortened, if desired, by using a wax containing white pigment directly over the first coat of gray lacquer, or after the stained surfaces have been sanded. However, the wax will not be as permanent as the white filler.—P. J. Marvington.

To Overcome Bleeding

Will you please advise us how we can overcome bleeding or changing the color when we stripe or refinish a red lacquer panel with a white or cream lacquer?—H. D. and S.

It is difficult to completely prevent a red lacquer containing "bleeding" colors from coming through or bleeding through white or cream lacquer applied over it. The trouble is due to one or more of the pigments in the red lacquer being soluble in the lacquer solvents.

This means that when the white or cream lacquer is applied, the solvents in this second coat soften the first coat of red lacquer to a certain extent and dissolve a part of the red pigment which comes up through the white coat and gives a pink or orange tone to the white lacquer

Two or three coats of pure

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Process patented in United States and foreign countries.

white shellac, thoroughly dried, or two or three coats of aluminum bronze powder, applied over the red and under the white lacquer, are often effective in preventing the red from bleeding into the white lacquer, but even these extra sealer coats will not always eliminate the trouble.*

Red lacquers are obtainable which do not contain bleeding pigments and, if it is necessary to apply the white lacquer over a red lacquer, you should specify, when ordering the red lacquer, that it contain no bleeding pigments. It will be much less trouble and safer, however, if you can rearrange your color scheme so it is unnecessary to use white lacquer over a red lacquer.—R. L. Masterson.

* A new "sealer coat" material, mentioned elsewhere in this issue, is said to be effective for this purpose. —Editor.

Stipple Effect on Metal Novelties

With reference to the question about stipple paste and securing a stipple effect on metal novelties (page 67, August) I happen to know of a flat paint to which can be added 4-lbs., plaster of Paris and one pound of ground mica, to one gallon of the paint to make a wonderful stipple paste.

This stipple paste can be brushed or sprayed on. When the brushing process is used, the material must be of a heavy consistency. Then, while it is still wet, take a round stiff-bristle brush and pound the surface (in hammer-like fashion), then let it dry, sand the tops of the rough-stippled places lightly and spray and shade with the colors desired.

For a spray effect, spray on a

The Blue Knight's Column

PANACEAS . . . cure-alls . . . infallibility . . . there ain't no such . . . not even with my product. Recently received: "We beg to advise that the lacquer has not worked out quite as we expected it would. . . ."

When I get a letter like this I don't drape my helmet with crepe. I don't crawl into a dark corner and cry. I just polish my spear . . . get a good edge and start trouble shooting.

Here's a history of the case as it finally worked itself out: After unsuccessful attempts to use two very well-known makes of enamel this customer ordered a commercial lot of my flexible enamel. He was unable to get results. I was asked to come to the plant and show him why my materials were not working properly . . . A change in the pressure of spraying and in the degree of thinning gave a perfect job immediately. A change in the location of the buffs; a change in the quality of the buffing wheel and selection of the proper buffing compound gave him the kind of job he had been seeking for a long time.

All this only serves to prove that this kind of work, in fact trouble shooting of all kinds, is part of my service. Can I be of any assistance to you? Address your inquiry to the Sales Department.

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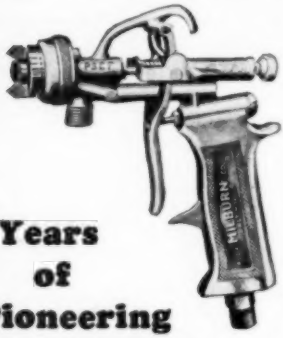

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This sturdy construction makes it practically immune to injury. It makes it impossible to get out of alignment. It keeps it IN SERVICE ALWAYS—DAY IN AND DAY OUT. No time is lost in the finishing room because the spray gun is in need of repairs.

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Before you add to your spray painting equipment, you owe it to yourself to investigate the FIFTEEN IMPORTANT FEATURES OF THE MILBURN GUN. Write for full details today. Ask for Bulletin 467-10.

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good even coat of the stipple, with the usual pressure of the pressure tank. When this coat is dry, take paste of the same consistency and spray it onto the surface after shutting down the pressure on the spray tank to about 15-lbs. This causes the stipple to flow onto the surface in a stippled effect. Spray the material during both operations at ordinary spraying consistency.

The following process has been successful for securing a stippled effect on metal novelties: Spray with one coat metal primer (lacquer). Follow with a second coat of lacquer ground color. Then, on the last coat, cut down pressure on the spray tank to 15-lbs., and spray with lacquer enamel of the desired color. This will give a smoother stipple effect this way in lacquer finish.

When using the stipple paste as previously mentioned, any desired effect can be obtained with the stiff bristle brush. A rough stipple or one in scroll-like fashion is possible. It is not compulsory to sandpaper when the stipple effect is dry, but sanding gives a more uniform and smoother finish. When the surface is not sanded, a rough material stippled effect is obtained. Color effects can be obtained by shading with the spray gun; also by high-lighting, such as wiping off the excessive color and leaving the remainder in the rough places. A finishing coat of varnish or lacquer should then be sprayed on.—J. Cowan.

Orange-Peel Not Caused By Different Thinners

This morning I happen to be a gentleman of leisure. I just finished reading the entire August issue of INDUSTRIAL FINISHING.

AIMS *and* AMMUNITION

To aim at a target is one thing — to hit the bulls-eye is an entirely different proposition. It's not only a matter of skill — it's a matter of ammunition as well.

So it is with your finishing problems. The battle is half won if your ammunition is right. And that incidentally, is where we come in. Our lacquers assure a better finish—and greater sales. They give a tough, mar-resisting surface that will not crack, peel, check or shrink.

It's easy to make a test.
Will you try it?

"No Tampering with Quality"

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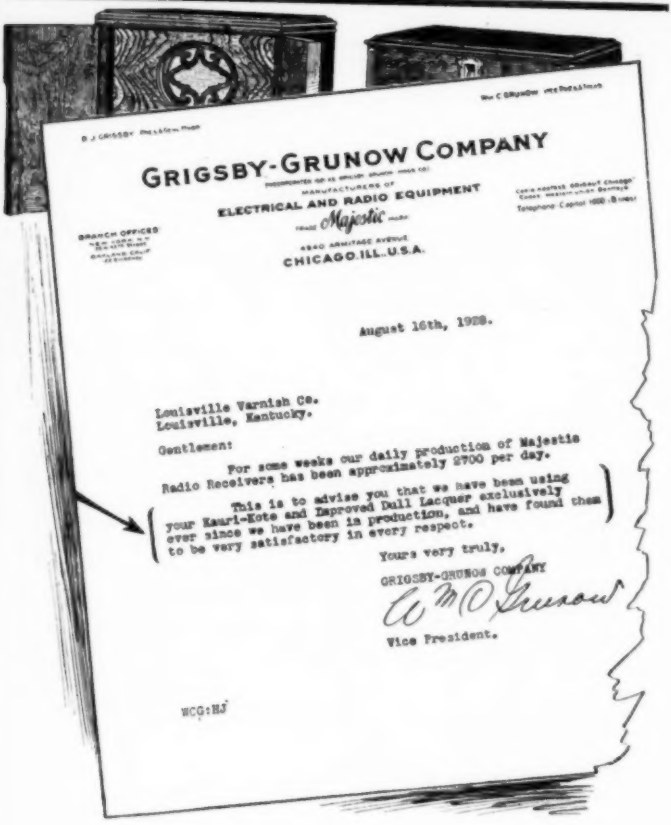
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Like a cynic, I think I have a lot of comments to make, but I will confine myself to a little mild criticism of a write-up on orange peel, by J. C. Alsee, on page 39, of the August issue.

In the automotive industry, outside of Fisher Body Co. possibly, there is no organization I know of that uses lacquer and thinner purchased from a single source. That is, any automotive corporation using a certain manufacturer's finish lacquers, is most probably using another manufacturer's thinners with the lacquer in use.

In other words, the lacquer and thinner are not generally bought from the same company. Nevertheless, they never have any such trouble as an increased amount of orange peel in their lacquer finishes, due to the use of thinner of a different manufacturer.

Quite often have I encountered the same sort of argument, both in the furniture and automobile trade, when a certain purchasing agent or superintendent of the paint division tells me that he is using XYZ's lacquer together with XYZ's thinner, because somebody else's thinner gave him trouble, or because it caused him a greater orange peel, or because somebody else's thinner is not as good as XYZ's.

I think that 90 percent of this argument starts in this man's head, instead of in his shop, because the manufacturer of a good lacquer always sees to it that the solvent composition of his lacquers is such as would stand abuse at the hands of the operator.

I can name half a dozen automobile companies using our lacquers; nevertheless, not one of them is using our thinners. On the other hand, half a dozen other

ZELLAC

The Truth About Zellac Colors

ZELLAC colors agreeably meet the public demand because they are *bright*--with a sparkling richness. Because of their *clarity*--giving them a distinctive life and depth. Because of their *variety*--in every subtle trend of color-shades. *Because Zellac color supremacy has been attained without any sacrifice of other lacquer qualities!*

Our color experts keep *ahead* of the conventional ideas. That's why we are always ready to supply any unusual color combinations desired.

Color is important to you as a present-day sales factor -- but not more important than the durability and quality that has been so successfully combined with economy in Zellac Lacquers. Let us deliver you a trial order of Zellac formulated on the basis of our experience as lacquer makers since 1886 -- specially formulated to whatever requirements you wish us to meet. Thereafter you have a definite assurance of uniformity at a distinct saving.

Zeller Lacquer Mfg. Co., Inc.

Zeller Building

20 East 49th Street **New York City**

Stockrooms and Offices at:

Chicago: 551 W. Lake St. ***Los Angeles:*** 786 Ceres Ave. ***San Francisco:*** 1039 Harrison St. ***Denver:*** Ormor Sales & Supply Co., 503 Fourteenth St. Distributors. ***Wichita:*** Ormor Sales & Supply Co., 452 N. Main St. Distrib'rs. ***Seattle:*** 2108½ First Avenue. ***Portland:*** 403 Hoyt Street. ***Dallas:*** Ormor Sales and Supply Company of Texas, 408 North Lamar Street, Distributors.

ZELLAC

ZELLAC

"Ty-Loid"
Striping
Lacquers

Are so balanced as to become a part of the Lacquer Enamel Coat.

Solid covering, clean edges, free working, clearness of tone, and fast to light are some of the features embodied in Ty-Loid Striping Lacquers.

Ty-Loid Striping Lacquers are applied the same as old method of striping and will not heel or deteriorate the striping brushes.

In conjunction with Ty-Loid Striping Lacquers, No. 51 Striping Thinner should be used to insure best resu'ts.

A trial will convince you of their merits and our prices are right.

Manufactured by

The Western Reserve Varnish Co.

1251 Marquette St. Cleveland, O.

automobile companies are using our thinners with somebody else's lacquers. Of course, there are a few companies outside of the automotive industry who use both our lacquer and our thinner.

In other words, I wish to bring home to INDUSTRIAL FINISHING readers, especially the purchasing agents and the finishing foremen, that there is absolutely no truth in the statements often made, either by unscrupulous lacquer salesmen or by equally thoughtless foreman finishers or purchasing agents, that with a certain type of lacquer, one must also use the thinner made by the same organization.

In fact, I am prone to believe that any good lacquer manufacturer has what he may call, a universal thinner, which is probably a better product than he is selling with his own lacquer. The object in making a better universal thinner is that the material may be used with anybody's lacquer.

Usually, these universal types of thinners are products that have certain blush-resisting qualities; that is, they are rich in medium and high-boiling solvents. They contain certain percentages of alcohols to take care of the various types of gums used by different manufacturers of lacquers.

They may contain cello-solv, chemically known as mono-ethyl-ether of ethyline glycol, because chemicals of that nature are more or less universally solvent for gums, except a few synthetic types, which, on the other hand, are readily soluble in hydro-carbons. A greater part of the thinner always constitutes non-solvent hydro-carbons—by non-solvent I mean non-solvent for nitro-

WATEROIL

At last - - - water colors definitely dissolved in oil base without precipitation!

WATEROIL has all the advantages of water stain and none of the disadvantages . . . absolutely will not bleed directly under lacquer . . . and filler will not wash the color. It also eliminates the need of sealer coats between stain and lacquer. Available in four "fast" shades . . . four principle colors, light and dark Walnut, Red and Brown Mahogany.

That frequent, customary trouble caused by an application of filler washing off the previously applied oil stain is eliminated when WATEROIL is used. An application of filler will not alter the original color.

WATEROIL will eliminate your common finishing difficulties. It is the key to complete elimination of raised fibers, blistered veneers, loosened glue joints, special wash coating, bleeding, mucky finishing, etc.

Order a trial drum or at least five gallons. Satisfaction guaranteed.

V. J. DOLAN & COMPANY

Wood Finishing Materials of "Unquestionable Quality"

1832 N. Laramie Avenue **Chicago, Ill.**

FILLERS VARNISHES
STAINS PRIMERS

WOOD FILLERS

SUCCESSFUL FINISHES depend on correct filling. **L-MAC-E** fillers provide a flint-hard, permanent, non-shrinking foundation. They dry overnight—no absorbtion of later coats.

These qualities are the result of a long experience in adapting the right silex base for knitting and the right binders for packing and sealing.

L-MAC-E fillers remain plastic until used enabling the use of the last pound as effectively as the first.

For a good Finish, Start Right by using L-MAC-E Fillers.

The Lawrence-Mc Fadden Co.

PHILADELPHIA, PA.

THE FILLER MAKERS

Kindly mention INDUSTRIAL FINISHING when writing advertisers

cellulose, but solvent for gums.

Mr. J. C. Alsee's remarks in regard to solvents that do not work satisfactorily with a certain product, and cause a lot of orange peel, may be true, if some unscrupulous salesman tried to sell him thinners either containing a high percentage of low-boiling solvents, or containing a very low percentage of high-boiling solvents and a high percentage of hydro-carbons, and even naphthas. Such products, of course, are marketed but not by manufacturers of repute.

As I said in the very beginning of this letter, I write this note merely to eradicate a wrong impression that exists in many a mind, and also the wrong impression created by the little write-up of Mr. J. C. Alsee.

I would be glad to hear further comment from Industrial Finishing readers on the subject, and if necessary, I will dilate on the subject to the satisfaction of everybody.—Kam N. Kathju.

Made *free* from gum

Auto Lacquers

Of Dependable, Superior Quality

We have been manufacturing for 70 years at Newark, N. J.

Chas. Cooper & Co.

10 Mulberry St. New York, N. Y.

Works: Newark, N. J. Established 1857

RAUX GUM RESINS

	M.P
Rosin Ester Gum	115°C
Congo " "	135°C
Manila " "	140°C

Gums cut, fused or treated to meet individual requirements.

ROBERT RAUH, Inc.

430-490 Frelinghuysen Ave. Newark, N. J

Dip Finishing; Consistency of Materials

Referring to A. B. F. Co's question in Sept. issue (pages 72 and 74) under the heading "Thinning Enamels and Varnishes for Dip Finishing," it is our belief that your trouble lies almost entirely in the fact that you are guessing at the consistency of your dipping solutions. We would suggest that you provide a hydrometer whereby the specific gravity of your mixture may be readily determined at all times. Then, when you have found the consistency at which best results are obtained, see that your mixtures are maintained at this specific gravity at all times.

It is practically impossible to insure satisfactory and uniform results unless you eliminate guess work in your finishing operations. You have no means of knowing whether your source of supply is giving you heavier enamels today than last week, and therefore, in merely adding 50 percent of naphtha you assume that you are getting the same mixture as you had before, while with the use of a hydrometer you are sure of it.

It is, of course, important to be sure that your material is properly agitated so that the pigments are maintained in perfect suspension; also that the temperature of the dipping room is kept as nearly the same the year around as can be conveniently maintained. It is quite natural that the material will run more freely in the extremely hot weather and therefore not cover as well as it will at a temperature of around 70-deg. F., which is the average temperature maintained about nine months out of the year.—Paasche Airbrush Co.

"INDUSTRIC"

F. O. S.

Masking and Dividing Tape

Six Points of Superiority

1. The edges are straight and true—cut by a special process that minimizes the tendency to ravel.
2. The adhesive compound is thinly but uniformly spread. Possesses at all times the ideal degree of adhesiveness. Goes on easy, stays put, comes off clean and can be used over again. Requires no heating or moistening.
3. The fabric base is of the finest quality muslin (not paper), closely woven, strong and doesn't stretch, or tear while applying or removing. Does not loosen in spots after application.
4. Careful attention has been paid to the packing. It is striking so that you can eaily remember the brand that gives you complete satisfaction. It is adequately packed so that it will always reach you in perfect condition.
5. Nationally advertised to the painting trade.
6. Made by a long-established, reliable firm. A permanent, dependable source of supply—and an iron-clad money-back guarantee.

Clip or tear here and mail this coupon today

THE SEAMLESS RUBBER CO., New Haven. Conn., U. S. A.

Send us your free manual on the uses of tape for masking, dividing and striping, also free samples and complete details.

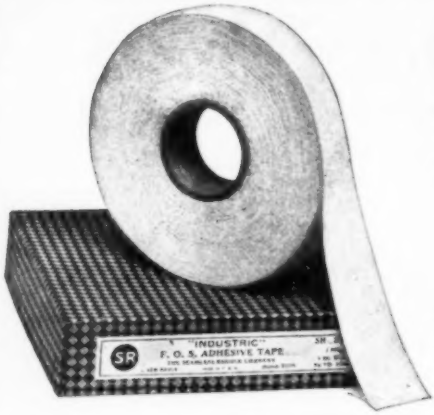
Print Your Name .....

Print Your Address .....

.....

(Check one) We are ☐ Jobbers ☐ Painters ☐ Body Makers ☐ Manufac'rs

We have been buying tape from .....



Cheap False Teeth

ARE FALSE ECONOMY

So Is Cheap Tape

Many a painter has tried to save from two to five cents on a roll of tape only to find that it ravels, or tears, or curls, or has a ragged edge, or that it is too sticky, or won't stick, or that the adhesive compound sticks to the newly sprayed surface. In such a case the correct thing to do is to swallow your medicine and buy good tape next time.

Your insurance against all tape troubles is the brown checkered box with the red disc. By using a low grade fabric, adulterating our adhesive compound and skimping our packaging, we could make tape as cheaply as anybody in the world. It wouldn't be good tape, however, and for a couple of cents a roll we won't risk a reputation for quality that it has taken us over half a century to build.

YOU WILL FIND THE BEST TAPE YOU CAN BUY CHEAPEST IN THE LONG RUN.

If your jobber doesn't carry "Industric" Tape, fill out the coupon on the other side and we will put you in touch with a convenient jobber who does.

THE SEAMLESS RUBBER CO.

NEW HAVEN, CONN., U. S. A.

MAKERS OF FINE RUBBER GOODS FOR FIFTY YEARS

(OVER)

New Materials and Equipment

Presenting briefly, certain outstanding features of new materials and improved equipment which have been developed for use in modern industrial finishing departments

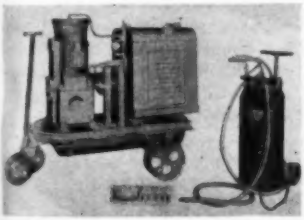
New Wood Stain Announced

V. J. Dolan and Co., 1830 N. Laramie Ave., Chicago, announces a new product called "Wateroil," in which water colors are dissolved in an oil base without precipitation. This new stain is available in light and dark walnut, red and brown mahogany. It is claimed that this new stain "has been tested and proved" and that it will not "fade or bleed, raise the grain, blister veneers, loosen glue joints or rub off under filler."

Gasoline Driven Airpainting Units

Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, has brought out a line of new gasoline-engine, portable airpainting units each of which is furnished mounted on a low truck, as illustrated herewith, or mounted on a two-wheel trailer. This new heavy duty outfit is available in several different models each consisting essentially of a Worthington air compressor, a Novo gasoline engine, air tank, air intake filter, automatic unloader, water and oil separator, gauges and fittings.

The painting unit to go with this outfit includes a portable pressure tank for holding paint material, a separator, air regulator, material hose and spray gun.



Portable and complete—for production or maintenance work.

Lacquer for Cromium Plating and Sheet Zinc

Roxalin Flexible Lacquer Co., 105 Seventh Ave., Long Island, N. Y., has developed a line of enamels which, it is claimed, have excellent adhesion and flexibility when applied to cadmium or chromium plated metal. The same enamels work equally well on sheet zinc, the finishing of which has given a great deal of trouble in the past.

New Electric Spray Gun

Metal Specialties Mfg. Co., 340 N. Kedzie Ave., Chicago, Ill., announces a new Presto Model No, 82 spray gun which, according to the company, "provides new flexibility, new speed, and new efficient operation to a method of accepted practicability and economy."

The attached, motor-driven air

CEL-U-LAK

NO. 109
Lacquer Metal Primer

We announce with pride the perfection of a Lacquer Primer of unequalled adhesion to all clean metal surfaces.

CEL-U-LAK No. 109 is a scientific and technical triumph. It adheres tenaciously, retains its adhesion indefinitely and serves as an ideal anchorage for subsequent lacquer coats.

CEL-U-LAK No. 109 comes in two colors; a neutral grey for most work, and a light blue for use under white lacquers. It air-dries in 1 hour or less under favorable conditions.

CEL-U-LAK No. 109 has been adopted by manufacturers of washing-machines, automobiles, kitchen utensils, ironers, tabulating machines and other metal articles where a quick-drying, adhesive metal primer was needed. It has shown most interesting results on glass, hard rubber and other difficult surfaces.

If you are interested in bettering the adhesion of your lacquer to your product or in eliminating the baking of your primer coat, try CEL-U-LAK No. 109.

THE Joseph F. Glidden VARNISH PRODUCTS Co
FOUNDER AND PRESIDENT

Dr. S. P. Wilson, Mgr., Lacquer Plant

12900 Beres Road Cleveland, Ohio

PULMOSAN
CHEMICAL CARTRIDGE
RESPIRATOR

A simple device using a container with chemical ingredients that neutralize and clean all harmful fumes from spray painting. The Cartridge filter under ordinary spraying conditions will last up to seventy-two hours in actual use. Extra cartridge furnished with each respirator. It does not deteriorate. **Price complete $6.00**

Extra Cartridges may be obtained at small additional cost

Manufactured by the **PULMOSAN SAFETY EQUIPMENT CORP.**

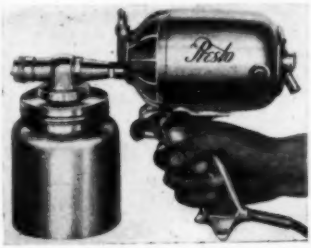
Manufacturers of SAFETY APPLIANCES, RESPIRATORS, GOGGLES, GAS MASKS, SAND BLAST HELMETS, ETC.

174 Johnson St., Dept. 29 **Brooklyn, New York**

compressor develops 25 to 30-lbs. of pressure, which it is claimed is sufficient to completely atomize and spray paints, varnishes, lacquers, shellacs, bronzes, liquid floor wax, insecticides, disinfectants and other reasonably thin liquids.

Some of the chief features of new spray gun are:

1—New fan nozzle, with two extra interior nozzles that give



The unit includes a motored compressor to supply air for spraying, a material container, spray gun and handle.

the operator three widths of spray. This fan nozzle may be interchanged with a round spray nozzle, also providing different widths of spray. The complete set of nozzles provide a range of swaths from ½ to 5-in. in width.

2—Bronze bearings, with the latest improved type wick oilers, assuring smooth running and long life.

3—A cork insulated handle that never lets the gun get too hot to hold, no matter how long it is used.

4—A seamless drawn-aluminum container that holds a full quart of liquid, the opening of which is large which aids cleaning.

The Presto extension cord can be plugged into any standard lighting circuit. The whole outfit only weighs 5½-lbs.

EASY NOW TO REPAIR DAMAGED FINISHES

Permanent repairs are easily and quickly made with Campbell's Stick Shellac. No use to lower prices because of damage—or to incur big expense of refinishing.

CAMPBELL'S STICK SHELLAC

Campbell's Stick Shellac easily restores scarred and scratched finishes to perfect condition. It is melted into the hole, dent or scratch and then rubbed down and polished. It is truly an ideal way to economically repair damaged finishes.

UNIVERSALLY USED

A color card of Campbell's Stick Shellac will be sent free to anyone upon request. Shows actual samples of the Shellac and the range of 54 different colors. Write for one today.

The M. L. CAMPBELL CO.
1007 W. 8th St. Kansas City, Mo.

CORUCO
F. O. S.
is the
MASKING TAPE
you have been looking for.

Send for free sample and prices

The Consumers Rubber Co.
1302-04-06 Ontario St.
Cleveland

Fast Penetrating Stains
Fast Shading Stains

Oil Red Mahogany 130
Oil Brown Mahogany 134
Oil Dark Oak 123
Oil Dark Walnut 119

Will Cut Your Color Costs.

Send For Free Testing Samples

PYLAM PRODUCTS COMPANY
Manufacturing Chemists
799 Greenwich Street NEW YORK

FRENCH'S 4 HOUR ENAMEL

Just as the name implies, an enamel that will dry to your satisfaction in 4 HOURS.

French's 4 HOUR enamel is waterproof and durable, has excellent flowing qualities and forms a hard tough film.

There are many more good qualities sealed in the can which space will not permit us to describe.

A communication from you and your request for a sample will convince you of the merits of this product.

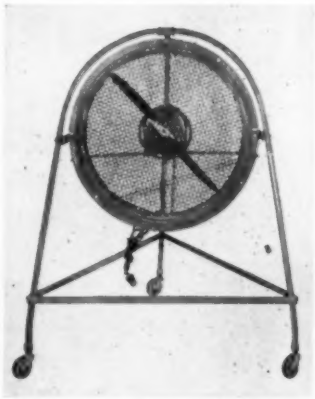
Do not fail to send us your finishing problems as our Research Department is at your disposal at all times.

Samuel H. French & Co.
Paint, Varnish and Lacquer Manufacturers
Philadelphia
Established 1844-Incorporated 1920

Portable Industrial Fan

Air-More Products Corp., 3402 Northwestern Ave., Indianapolis, Ind., has recently developed a new electrically-driven portable fan for such industrial uses as speeding up the drying of parts or articles in process, accelerating ventilation in certain areas, and similar purposes.

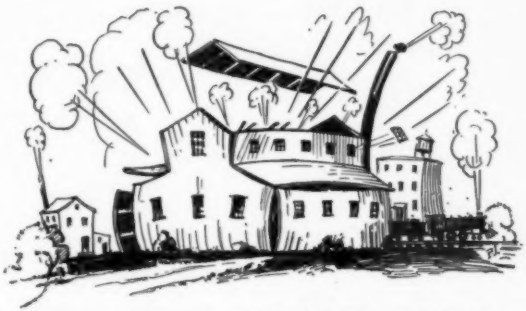
As shown in the accompanying illustration, the directly-motored fan is incased within a shielded ring which is mounted in a tri-



The shielded fan is portable and adjustable

angular frame that rolls on rubber-tired swivel casters. The circular casing that surrounds the motored fan is pivoted at two opposite points in such a way that it can be tilted to direct the draft downward or upward, as well as straight outward on a level.

The propeller blade is nickel-alloy aluminum, mirror finished. An outfit equipped with a 24-in. propeller is furnished with a 1/6 h.p. motor (vapor proof or enclosed type optional) and is supplied with extension cord for plugging into an electric light



THE OLD HOME HAS GROWN TOO SMALL

PENTASOL and PENT-ACETATE are now in such demand for lacquer formulation by the leading manufacturers of the country that we have been compelled to substantially increase the capacity of our plant at Charleston, West Va. Tank-car after tank-car of these PURE solvents is already going into the make-up of the finest lacquers on the market.

Such unusual demand for such comparatively new products lies in the fact that the introduction of PENTASOL and PENT-ACETATE has made it possible for the industry to secure—for the first time—pure amyl solvents of uniform quality and in the commercial quantities required for lacquer formulation.

The real value of the quality, uniformity and economy introduced into lacquers by the use of PENTASOL or PENT-ACETATE can only be demonstrated by a trial—or by asking any of those now using these solvents. (Samples are furnished upon request.)

The SHARPLES SOLVENTS *Corp.*
2304 WESTMORELAND ST., PHILADELPHIA
548B RAILWAY EXCHANGE BLDG., CHICAGO
501A FIFTH AVE., NEW YORK

VILAS MIXING TANKS

To Replace Uncertain Mixing By Hand

Hand stirring of mixing materials is obsolete and inefficient. In keeping with modern tendencies toward speed and accuracy, many progressive concerns have removed the uncertainty of hand mixing, employing Vilas mixing tanks in their finishing rooms.

The Vilas portable mixer assures constant uniformity of lacquer, paint, enamel, Duco, varnish, etc. No evaporation — no loss of operator's time mixing spray cup at a time — no guess work about materials being thoroughly mixed — and many other advantages.

Get further facts, without obligation; many new improvements in keeping with latest developments in finishing materials — ask for latest catalog today.

ROYAL L. VILAS, INCORPORATED

EASTON, BRIDGEPORT, CONN.

SAVE BY SAVING

for toy finishers
for automobile builders
for machinery p s
(for all finishers)
for furniture manufacturers
for stove manufacturers
for automobile refinishers

for artistic effects
NATIONAL
Decalcomania Transfers
Much of the artistic beauty of present day furniture is heightened by the use of decalcomania transfers—National Transfers in many instances, because of their true reproduction character, wide range of selection and economy of application. For 40 years, National Decalcomanias have appealed to manufacturers of furniture, kitchen cabinets, fixtures, toys, etc.—Quality Transfers at Lowest Prices.
WRITE FOR SAMPLES AND CATALOG!
National Decalcomania Corp.
222 N. 60th St., Philadelphia, Pa.

socket. Height, 46-in.; weight, 70-lbs.; floor space, 38-in. triangular. The company also makes air-exit ventilating and drying fans (with out the stand) in 12-in. and 24-in. sizes.

"Seals Bleeding Stains"

A sealing undercoat called "G RC" is announced by the G R C Corporation, 9 S. Clinton St., Chicago, Ill. According to the company's bulletin this new sealing undercoat—

1—Can be sprayed or brushed;
2—Dries quickly;
3—Can be used under enamel or lacquer;
4—Isn't penetrated by lacquer solvents;
5—Prevents lifting or wrinkling of old finishes, refinished with lacquer.

Instructions for using the new material, as submitted by the manufacturer, reveal considerable information referring to its various uses.

In the first six months of 1928, business increased 8 percent over the same period for last year.

Tests have been completed by the Material Division of the War Department Air Corps for determining a suitable substitute for spar varnish in producing a gloss or semi-gloss finish on doped fabric-covered surfaces of aircraft. The results indicate that no clear gloss finishing material is as satisfactory as one containing a small amount of pigment, both as to flexibility and as to durability of the gloss.

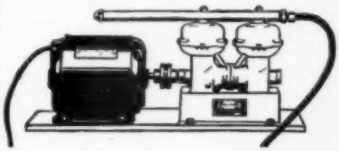
E. M. Reeves Co. Moves

E. M. Reeves Co., manufacturer of striping tools and accessories, formerly located at Campbell and Cape Girardeau, Mo., announces a change of address to 228 West 12th St., Flint, Mich.

ONLY $57.00
Completely Equipped
SPRA-MORE
PORTABLE PAINTING MACHINE

The ONLY Low-Priced Spray Unit that has adjustable Spray Head—from fine line to full five-inch fan-shaped flow!

The SPRA-MORE Painting Machine, with its "big unit" features, is becoming little short of a sensation in its great performance in all kinds of finishing work. It handles lacquers, enamels, varnishes and paints. It delivers a steady flow of DRY, CLEAN AIR for perfect finishing results -- without a trace of oil or water. Sturdily constructed of the finest materials -- guaranteed to render unfailing service. Equipped with genuine No. 9 Crown Spray Gun.



There's a Dealer Near You
Write for SPRA-MORE Bulletin
CROWN SPRAY GUN MANUFACTURING CO.
1218-B Venice Boulevard
Los Angeles - California

The Lure of Low Priced Finishing Materials

Pointing out the unfortunate experience of certain manufacturers of medium-high-class products who switched to cheaper finishing materials that were supposed to be "just as good" as the higher priced materials.

By C. Dan Youngs

ONE OF THE MOST common fallacies in the finishing industry of today is the belief that high grade finishes can be purchased cheaply. It is probable that no day goes by, in the life of an industrial finish salesman, without his being told one or more times, "Your price is too high." It is true that this is often the case; the prices of most high class finish manufacturers *are* higher and often much higher than the buyer can secure from other concerns selling finishing materials.

It is unfortunate that in many cases the buyer looks no farther ahead than the initial cost, for if he did, he would undoubtedly buy his finishes at the higher figure. It is doubly unfortunate when he does not realize that the initial cost delivered at his plant, plus his labor and overhead, is not his final ultimate cost. In the last analysis, the sum of his cost is reflected in the degree of satisfaction his product is to give to the final purchaser or the ultimate consumer. On this foundation rests his sales.

There can be no question but what the final appearance and the permanence of his finish is one of the most vital elements entering into a manufacturer's sales problems today. If the finish looks cheap, cracks, peels, alligators or loses luster, the idea at once leaps forth in the mind of the beholder that the entire article is cheap and inferior—no matter how excellent it is nor how careful each operation in the manufacture has been safeguarded. Yet, some manufacturers, thinking to save 50c or $1.00 a gallon will buy and use cheap finishes simply because they are told they are O. K. and equal to the best.

An Automobile Experience

Cases of this kind come up every day. Not long ago a manufacturer of a well-known medium-priced car decided he was paying too much for his finish and was applying too many coats. After considerable discussion with a lacquer manufacturer who evidently saw only the initial sale, he decided to use a cheaper lacquer, and he did so.

Within four or five months after this change was made he found to his sorrow that his cars looked years older than they really were; the luster had totally gone and in a few more months his sales were appreciably diminished. He is still paying for his mistake because the idea still persists that his car is a cheap one, simply due to the

Invite us to show you

Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

AIRMODE

A FAN SPRAY

ONLY
$14.00

Operates Off Any Air Supply of 2 Cu. Ft. or More

WONDERFUL ATOMIZATION

COMPLETE 4 CYL. SPRAY UNITS

Model C- With Fan Gun $95.50 } F. O. B. Factory
Model C- With Conical Gun 89.00 }

DEALERS WANTED

C. L. TITTEMORE CO. (Dept. A)

533-39 Market St. San Francisco

ALACO LACQUERS

for all INDUSTRIAL PURPOSES

ATLANTIC CHEMICAL CO. Lacquer A-LAC-O PRODUCTS IRVINGTON NEW JERSEY

Durability, elasticity, non-porosity, adhesion, permanency, quick drying—all of these are prominent characteristics of Alaco Lacquers. Whether for use on metal or wood, whether for outdoor or indoor use, there is an Alaco Lacquer for your purpose.

NOTE: Our Industrial Engineering Department is at your service to develop special finishes as required — without charge. Write for complete information and color chart.

Lacquer Enamels, Surfacers and Primers. Clear No-Tarnish and Wood Finishing Lacquers.

Atlantic Chemical Company
Manufacturers of High Quality
Lacquers for 18 Years
Irvington, N. J.

fact that there are thousands of these automobiles on the streets impressing prospective buyers with the fact that the car is cheap because of the poor finish. As a matter of fact, the car is a good one of it's class, but cheap finish ruined it.

And Radio Cabinets

About a year ago a manufacturer of radio cabinets decided he could get along by using a cheaper lacquer than was ordinarily sold, and thus secure an advantage in a highly competitive field. A short time later he was obliged to refinish these cabinets; although he threatened to sue the finish manufacturer and did secure a cash settlement, yet he lost his prestige as a high class manufacturer and also lost several fat contracts.

Also, Caskets

A large casket manufacturer was paying $2.50 per gallon for a clear finishing lacquer in drums when a high-pressure salesman came along and convinced him he could save money by contracting for 50 drums at one time at the low price of $1.10 per gallon. Evidently making them in that quantity would lower the price $1.40 per gallon. He fell for this and signed a contract for 50 drums of lacquer, taking five drums at once and discounting his bill.

Long before he had used up the first drum he found out that he had been stung. He also found he had no redress for he had signed a contract for 50 drums of "lacquer"; such is the flexibility of the word lacquer, that his lawyer told him he would have to prove that he had not received lacquer, before he could sue for damages. Another lesson learned in the school of experience! Yet,

Keep posted!

on the best supplies for your finishing shop

EVERY up-to-date finishing shop manager and foreman wants to know about the new developments that will help turn out better work more quickly.

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Line application on furniture, automobiles, toys, fixtures, etc., made easily, rapidly and economically with the Reeves Striping Pencil.

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if this same man had gone into a shoe store and been offered a pair of Florsheim shoes for $2.00 he would have laughed at the offer.

"Lacquer is Lacquer"

It would greatly surprise the manufacturer who is engrossed in his own business to realize to what an extent the use of cheap finishes is gaining ground in industry today. It is a common thought that "paint is paint" and "lacquer is lacquer," and there is apparently no realization whatever that there can be literally thousands of intermediates between the highest and the lowest grades.

Probably there is no other field of manufacture existent today which so readily lends itself to deception, or where it is so possible to meet a price by turning out cheap inferior goods, as there is in the paint field. Providing the color is right, the working qualities fairly good and the manufacturer and his salesman without business ethics or scruples, there is no limit to the field in which this duplicity can be and is practiced in the sale of industrial finishes. If the amount of money secured in this way could be known, the sum would be staggering.

500 Manufacturers

There are over 500 firms manufacturing finishes in the U.S. today, and there is probably 500 times that number using them in manufacture. What they use, or care to use, is of course their own private business—just so long as they do not mislead their customers into believing they are securing more for their money than they really are.

If the sales price of a product is low and it's class is low, there

Armitage Armorlac

There are a number of very good reasons why Armitage Armorlac is gaining greater favor every day. Here are the chief reasons:

1 It is a Lacquer finish of utmost dependability.
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3 A beautiful, durable finish is always produced, whether Armorlac be applied over Metal, Wood, Reed or Composition. All surfaces are alike to Armorlac.
4 Armorlac is unusually adhesive.
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Makers of Varnishes and Lacquers.

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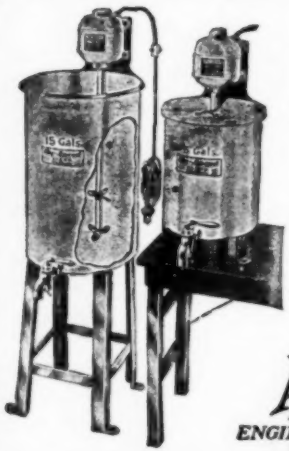

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Sprays never vary in intensity when they are mixed by

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PORTABLE ELECTRIC MIXERS—A perfect mixture is always ready for the gun in a small fraction of the time wasted by hand or mechanical methods.

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ALSOP

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is no valid reason why the manufacturer should not use just as cheap a finish as he can secure; but where the product is high class, sells at a good profit and is supposed to be well constructed and well finished—then, if a cheap finish is used, the manufacturer is simply cheating the ultimate buyer, and fouling his own nest.

Ruined Reputations

It is thus seen that there is a limit beyond which the reputable manufacturer of finishes will not want to go in offering for sale a finish which is inferior. And there is also a limit beyond which the manufacturer of a finished product will not go, provided he is wide-awake and alert. He will be chary of ruining a reputation for quality which it has taken a life-time to build, and he would recoil in horror if someone suggested that he cheapen his product in such a way that the public would not know at once. Yet many otherwise reputable manufacturers will take the chance of this through the belief that a quality finish can be purchased at a cheap price.

He knows he cannot buy high grade lumber for the price of No. 3 grade; that he cannot buy a $50.00 suit of clothing for $10.00; that he cannot buy a porterhouse steak for the price of a round steak; that he cannot buy a Cadillac for the price of a Ford. Yet why in the name of common sense does he expect to get a $3.00 lacquer for $1.00 and get the same results?

It is probably true that in most cases he is mislead by a certain kind of sales talk, and that his knowledge of the expenses, the elements and the operations involved in the making of finishes is negligible. He is probably

new!

Economy Deluxe Sprayer

For the user of industrial spray equipment this new *Economy DeLuxe Sprayer* gives better application of any paint, varnish or lacquer. Combines high efficiency, simple operation and puts new life in the paint shop. Light in weight, does not clog, easily cleaned. There are many good reasons for the present popularity of Economy Spray Products PRICED: *DeLuxe Spray Gun—with material tube, cover, container, 25 feet air hose and connections and agitator . . . $32.00. Above without agitator . . . $30.00. DeLuxe Gun without any of above accessories . . . $22.00. 25 feet air hose with connections . . $4.50. 1 quart metal container without cover . . . $2.50.*

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Please ship me equipment listed on margin. Send complete specifications and data on other Economy Spray Equipment.

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FOR CRACKED VARNISH

Brushed on over the old varnish scientifically "knits" and welds the old varnish together, closing all CRACKS and CHECKS permanently, at the same time brings back the life, color and beauty of old varnish on fine
Furniture, Cabinets, Pianos, etc.
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"Practical COLOR Simplified"
Shows You How to Use Color Effectively
THIS new, authoritative book on color, by William J. Miskella, M. E. (Consulting Engineer on Finishing Problems) contains hundreds of practical ideas on lacquering, enameling, painting and coloring.
Shows you how to choose, harmonize match, mix, light and identify color.
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128 pages.
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LABORATORIES, INC., *Chicago*
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honest in his belief that the higher class manufacturers are making exorbitant profits; that their prices are higher because of this. But is this so?

Prices That are Level

A canvass of the 25 or so larger manufacturers of lacquers, which are most prominently known, will show that their sales prices are about on a par. One may be a little higher on one item than another, and vice-versa, but taken on an average the prices will run about the same. This is not due to price-fixing, for there is none of this in the paint manufacturing industry today.

Choose by Test

It is obvious that the prospective purchaser of finishes cannot investigate the raw material purchases, or the plant and methods of each manufacturer who tries to sell him. He must, perforce, meet the problem another way, and the most logical way is by time and exposure tests. It is not sufficient to look at the appearance of the finish just after it has been applied, nor to place too much dependence on its working qualities. It is essential that he go farther and find out how it will look in six months or a year after it is applied. Only in that way lies perfect safety.

After all, in most cases, the cost of good finishes per unit is one of the smallest items entering into manufacture of the largest majority of products, and an additional cost of $1.00 or so per gallon would increase the cost but very little in comparison to the greater value received through the use of a good grade of finishes.

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BAKED FINISHING

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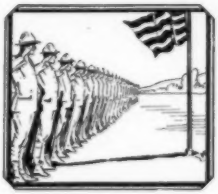

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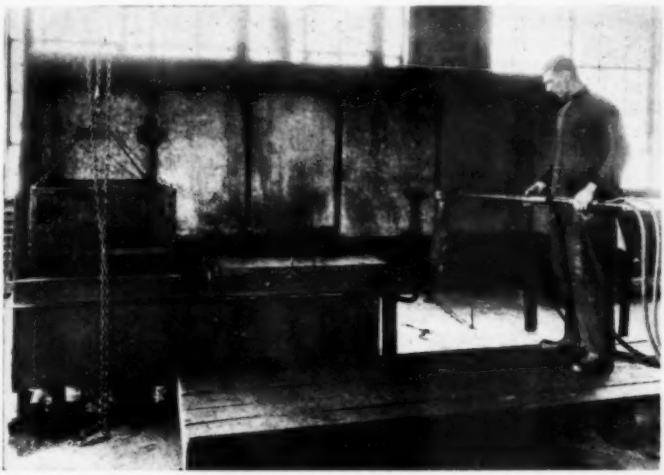


This photograph shows the operator using a steam gun to clean repair parts. Steam at 60 to 80-lbs. pressure for the steam gun, and to heat the large cleaning tank shown, is supplied by a 6-h. p. steam boiler located behind the cleaning tank.

Automotive Refinishing Cleaning, Dipping, Baking

Calling attention to some of the metal cleaning, dipping and bake-finishing equipment and methods used in the maintenance divisions of large concerns which refinish their own motor cars

By J. B. Nealey

ONE DEPARTMENT of modern automobile refinishing that is receiving increasing attention of late years is that for cleaning parts to be refinished. Numerous labor-saving devices have been perfected for this purpose, one of them being the hot-solution cleaning tank, while another is the application of a hot solution under steam pressure.

Many cleaning preparations are now available which are harmless to the hands and which are especially adapted for use in water solution. Efficient cleaning is usually done at a temperature of 188 to 212-deg. F.

In the case of tank heating, immersion heaters have come into common use. In many localities, whenever an open gas flame is employed, the work must be housed in a room separate from the main plant or garage—a room of fireproof construction—but by using the inclosed-flame-type immersion-heater, cleaning tank and steam boiler, it is not necessary to

Excerpts from an article that appeared in Industrial Gas.

construct a separate fireproof room.

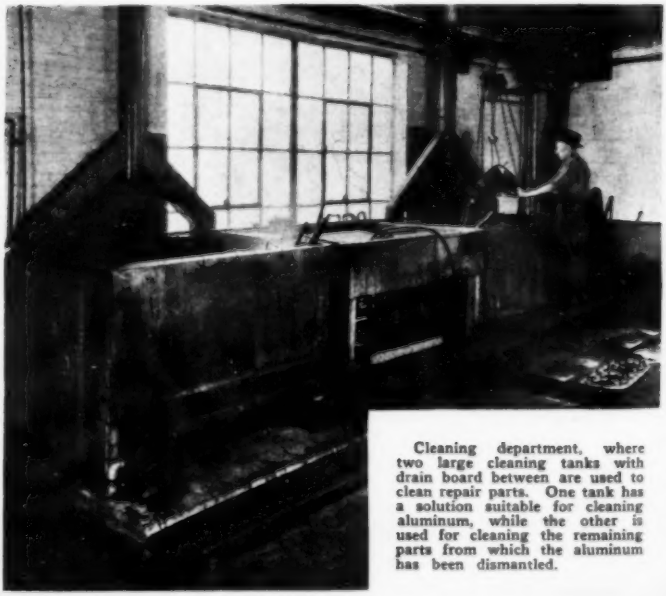
In the maintenance division of the Yellow Taxi Corp's. modern three-story building, in New York City, the cleaning of parts is accomplished in two gas-fired cleaning tanks. These tanks are 2-ft. in depth; one is 5-ft. long and 3½-ft. wide; the other 7-ft. long and 3-ft. wide. The japanning is done in a separate fireproof room where gas-fired ovens are used for baking the japan.

Parts to be japanned are dipped into tanks full of japan and then hung overhead to drip before they are put into the ovens. These ovens are 7-ft. wide, 10-ft. deep and 8-ft. high; the baking period and temperatures are regulated to suit the color being baked. The ovens are designed to bake by means of indirect radiant heat and preheated hot air.

Another fireproof room houses the paint department where the chassis and car bodies are painted both by hand and the spray method, and then air dried.

In the service station of the Mack International Motor Truck Corp., the cleaning tank is 4-ft. wide, 7-ft. long and 2-ft. deep. It has a drainboard on one side and the whole equipment is hooded to remove steam vapors.

This tank is heated with a steam coil, the steam being supplied by a modern gas-fired steam boiler. This boiler is of the inclosed-flame-type specially designed for garages. Fire hazards are practically eliminated, this in turn removing the necessity for a separate fireproof room. The gas



Cleaning department, where two large cleaning tanks with drain board between are used to clean repair parts. One tank has a solution suitable for cleaning aluminum, while the other is used for cleaning the remaining parts from which the aluminum has been dismantled.

Japan Stripped in ¼ to ½ former time

OPERATION — Stripping black japan, baked at 400° F., from brass and steel punchings.

FORMER METHOD—Used caustic soda—1½ to 2 lbs. per gallon of water. Stripped in from 2 to 24 hours.

PRESENT METHOD — Use INTERNATIONAL No. 2B—9 to 10 oz. per gallon of water. Strips in from ½ to 12 hours maximum.

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If so write me for a trial lot of "2B."

Internationally yours
John Bright

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flame, entirely inclosed and sealed from the garage atmosphere, receives both primary and secondary air for combustion through a pipe which passes to the outside of the building. Flue products are

Interior of one of the two japanning ovens used for baking enamel on fenders and hoods.

exhausted through another pipe, also leading to the outside of the building. The burner is lighted by spark-plug ignition.

A feature of this unit is its flexibility. In addition to heating the cleaning tank, this boiler also supplies heat to a 22-gallon, portable solution tank and furnishes high-pressure steam to a steam gun. Long lines of hose from the boiler permit of setting the tank at any point in the plant to obtain effective use of the steam gun without moving the trucks.

The steam gun siphons the boiling-hot cleaning-solution from the portable steam-heated tank and directs a jet of steam and cleaning solution. This equipment speeds up such work as taking down, repairing and repainting the chassis.

Clean Spray Booths

A neat appearing desk or machine produces a first impression that affects a stranger favorably when he enters a finishing room for the first time.

When an outsider comes into a finishing room, even though the interior of the booth he sees is perfectly clean, if the outside of the booth is covered with dust, or if paper or rags have been thrown beside the booth, under a bench, or on the floor, he receives an unfavorable impression.

The outside of a booth coated with patches of color—and with containers, racks and frames scattered all around—may, because of its untidy appearance, cause trouble. I know of one instance where a stranger who visited a plant happened to be an insurance inspector. The outside of the booth made a bad impression and, as a result, the firm had to purchase new equipment.

When there is a spot of stain or color to be removed from the exterior of the booth, this can be attended to easily by wiping it off with a cloth moistened in the thinner for that material, or with some other solvent. Just rub on a little and you will soon have the booth clean and tidy in appearance.

One operator I know always keeps the front rim of his booth, where the name plate shows, cleaned up and coated with dark enamel so that the name plate is always clean and easy to read.—B. P. Allen.

One of the great problems of aviation today is to acquire and distribute accurate information as to weather.

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Lilly's Baking Finishes enjoy the same splendid reputation that characterize all Lilly products . . . . they are known throughout the continent for their quality and reliability . . . . they always live up to what is claimed for them.

Lilly's Baking Enamels are particularly suited for use on motors, stoves, sewing machines, fenders, auto accessories, metal boxes, typewriters, telephones, etc. In fact, they are unsurpassed for use wherever a baked finish is desired either black or colors—ask for sample.

LILLY VARNISH COMPANY
INDIANAPOLIS, IND.

Chicago, 273 North California Ave.

Made by Industrial Finishing Specialists

Baked Finishing Varnishes

The purpose of baking varnishes, their value as protective coatings over baked enamel finishes, the requirements imposed and what precautions to observe when using them

By C. Y. Danielson

NOT every varnish in use in the finishing industry of today is capable of withstanding the requirements of a baking varnish although there are times when finishers will, against their better judgment, try to use a spar or other air-drying varnish in their bake ovens.

The uses of baking varnishes are two-fold. First they are used as a vehicle to extend and render capable of application, enamels made from a combination of paste color, ground either in oil or japan, with baking varnishes, this taking the place of ready-for-use baking enamels. A finisher must be skilled in his work to make his own baking enamels, as there are strong probabilities of getting his product either too heavy or too thin, in which latter case the opacity or hiding power is such that an additional coat is required.

Also, there is the problem of securing the correct shade and this is, of course, important wherever a batch must be mixed to finish a number of production units that follow a number previously finished with a prior mix. For this reason it is preferable to buy the baking enamels from a manufacturer, ready for use, but a great many finishers prefer to mix their own.

The reason for this can be readily seen if occasionally some color is required which is not a standard, and where but a little of it is needed. No paint manufacturer cares to make up small batches of special colors, owing to the cost of tying up equipment for a small batch where a much larger one could be manufactured at the same labor and equipment cost. But this is done, of course, where the account justifies this procedure.

Protection Afforded

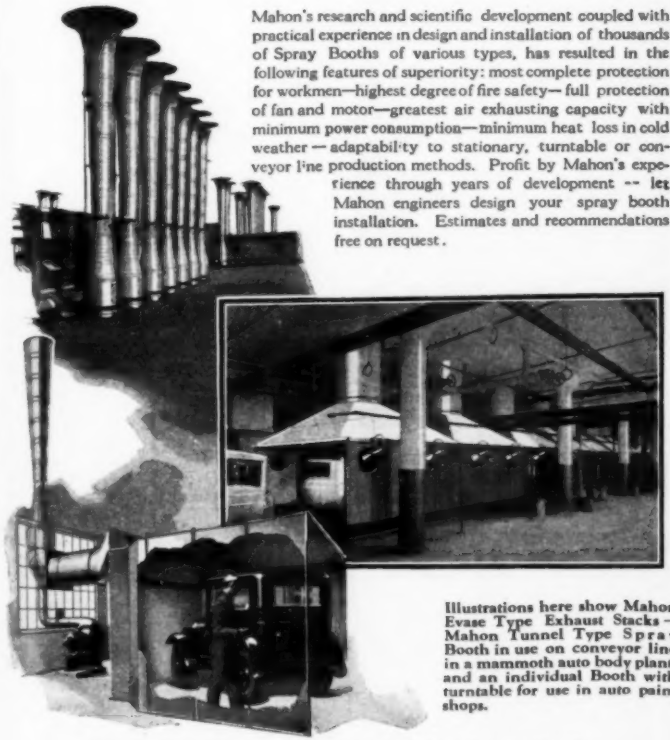
The second use in baking varnishes is the protection given to the object by the hard film which is the final coat, and which will in no way discolor or change the shades of the colors underneath. Even though the under colors are made by hard baking enamels, it is obvious that an additional coat of baking varnish will more than double the life of the finish, and will not render the finishing cost prohibitive in most cases.

There are several requirements of a good baking varnish which will be different than those of an air-drying product. Due to the nature of the drying or hardening process—by heat rather than air oxidization—the vehicle of the baking varnish must be such that it will not break under the heat of the oven. The time allowed for the hardening of a baking varnish is about one eighth or one tenth of the time required for the air-drying product, hence, due to the strenuous requirements of baking there must needs be a totally different structure required.

Chief Requirements

A baking varnish must spray easily; that is it must go through

Mahon Spray Booths for Every Purpose



Mahon's research and scientific development coupled with practical experience in design and installation of thousands of Spray Booths of various types, has resulted in the following features of superiority: most complete protection for workmen—highest degree of fire safety—full protection of fan and motor—greatest air exhausting capacity with minimum power consumption—minimum heat loss in cold weather—adaptability to stationary, turntable or conveyor line production methods. Profit by Mahon's experience through years of development -- let Mahon engineers design your spray booth installation. Estimates and recommendations free on request.

Illustrations here show Mahon Evase Type Exhaust Stacks—Mahon Tunnel Type Spray Booth in use on conveyor line in a mammoth auto body plant, and an individual Booth with turntable for use in auto paint shops.

Write for our latest circular on Mahon Spray Booths.

The R. C. MAHON COMPANY, Detroit, Mich.

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the gun with no stickiness or tackiness and it must have self-leveling qualities which will enable it to flow out over the surface being coated without piling up on the corners or edges. It must have paleness of color so that when used over whites, creams, ivories or any light shades, it will not discolor or change the shade. It must be almost a damar, although damar varnishes cannot be successfully used for baking or for outside exposure.

It must be so constructed that when it becomes heated in the oven it will not alligator, crinkle, or check. This is usually the case where so-called spar varnishes are baked.

It must be capable of hard baking so that when taken from the oven there is no tackiness to which finger-prints, dust or dirt will adhere. And above all it must have long life so that when the object is exposed to the atmosphere it will not powder or chalk off within a short time. Some so-called baking varnishes will not withstand outside exposure for more than three months, and the powdery break gives a miserable appearance to the product. A good baking varnish should be able to withstand outside exposure for 15 months in all kinds of weather, but experience has proven that there are few on the market today capable of doing so.

Precautions to Observe

Baking varnishes should never be applied under a temperature of 70-deg. F., and the article to be coated should be the same temperature. Trouble is always experienced when they are applied to a cold surface, or when they are thick or viscid due to the cold. The oven heat should be raised gradually and it is imperative that

a thermometer be used. Guesswork has ruined more than one baking job.

It is also important to carefully watch the heat when applying baking varnish over colors, as naturally, they cannot be baked at a higher degree of heat than can the original color. Should this be done, the color will change, due to the excessive heat, and the product will be ruined.

The cost of the average high grade baking varnish will run from $2.50 to $3.00 per gallon and since there is no absorption in the application, it will cover a great many square feet of surface. When it is considered that the use of this product as a weather resisting finish coat is so small, it is to be wondered at that more of it is not used on articles which have to withstand exposure to the elements.

No matter how brilliant the man may be, if he lacks enthusiasm he cannot realize the maximum upon his abilities and efforts.

Mechanical engineering solves specific problems by working them out carefully in the light of universal principles.

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EDITORIAL

Present Business Outlook

According to *Commerce Monthly* published by the National Bank of Commerce in New York, fall business will be good. A high rate of industrial operation through the summer has resulted in a general feeling of confidence regarding the balance of 1928, and plentiful harvests and the prospect of full employment through the fall promise an active demand for the innumerable articles that make up the necessities of modern living.

A normal seasonal increase in business is clearly in prospect, which will compare the more favorably with 1927 because of the declining trend of the latter part of that year.

Employment has been maintained at a satisfactory level this summer. Factory employment has been lower all year than in 1927 but, contrary to the usual trend, it gained a little in June and declined by less than the seasonal amount in July. The smaller number of men employed in factories has also been offset by a larger amount of outside work. Metal miners, harvest hands and building labor have all been in good demand.

The greatest activity in manufacture continues to center about the steel and steel-using industries.

With a favorable background of industrial employment and good crop yields, it seems likely that the present expectations of a substantial increase in retail trade over the latter part of last year will be realized.

Wasted Materials

A number of industrial finish users have become more or less concerned about the wasted spray that remains in evidence around spray booths—perhaps overlooking what a small percent it really represents when one takes into consideration the area and character of surfaces covered in a given length of time, the speed and thoroughness with which the work is performed, and the low labor cost involved.

However, any evidence of waste materials naturally prompts management to think, and often to speculate on whether the waste material could be substantially reduced or, if not reduced, whether it could be salvaged profitably. Many readers have written to INDUSTRIAL FINISHING about the possibility of reclaiming wasted lacquer spray.

An interesting and valuable article on the subject appears elsewhere in this issue—revealing

the experiences of a typical manufacturing plant in connection with this problem of reducing or reclaiming lacquer wasted at the spray booths. The superintendent tells how he set out systematically to reclaim wasted lacquer, what results he had and where he finally discovered something that has enabled him to really cut down the wastage of lacquer finishing materials.

Industry's Problem Today

A profound industrial change took place when, immediately after the war, the cost of labor and materials doubled with respect to the cost of capital. Executives and all others who have to deal with these three basic industrial factors were "robbed" of the familiar cost comparisons with similar work previously done. This condition called for more study, and more fundamental study on the part of industrial managers.

More attention is being given today to basic costs and industrial trends than ever before in the history of this country. For continued prosperity, it is of the greatest importance that all national agencies representing specialized knowledge and skill cooperate for the benefit of industry as a whole. With such co-operation, there is every reason to expect continued and increasing prosperity, because we can grow fat on what may be saved from the present industrial waste.—American Engineering Council.

Research to Determine Sales Methods

"The old, intuitive method of determining business policies is gradually being replaced by fact-finding, because modern business has become too complicated for guesswork or for rule-of-thumb methods. Progressive business has lifted a page from the experience of science and there is a growing realization that the formulation of successful management policies must be based on the accurate and thorough collection, organization and interpretation of facts.

"It is not surprising, therefore, to find a definite trend among progressive employers to supplant opinion, as a basis for business judgment, with fact-finding. As a result, the executive has essential facts which deal with the internal structure of his business, as well as information on external economic data which, directly or indirectly, may affect his operations."

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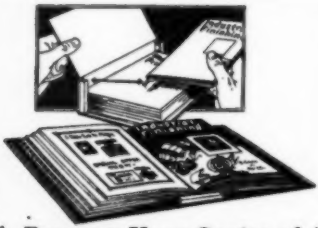

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within the next few years. The problem of commercial air transport is not technical development but traffic development. The present widespread interest in flying promises to solve this problem.

It seems probable that within a few years planes will carry a large part of the first class mail and considerable express and mail other than first class for distances greater than 500 miles. For distances up to 1,200 miles, many of the communications now sent by telegraphic night letter will go by air. Passenger traffic may develop slower than mail and express but, encouraged by the railroads, it probably will not be many years before passenger transport by plane will be as important as either express or mail.

All cross country flying, whether transport, service or private, is dependent upon adequate landing fields and upon well marked and lighted routes. Airports are being supplied by cities and towns and the Federal Government is rapidly developing a system of lighted airways. The establishment of these ground facilities not only makes air transport possible but also greatly stimulates private flying.

There are now more than 40 air lines operating on a fixed schedule over airways of 13,000 miles. Twenty-three of these carry mail. Contracts have been awarded for seven additional mail routes on which operations will soon commence. Over 20,000 lbs., of mail and express are being carried daily. Ninety-five percent more air mail was carried during August than in July. The total number of miles flown every 24 hours is over 30,000. These figures are for the air transport lines only.

Air service operators, which,

according to the Department of Commerce estimate, number over 600, are flying several times the transport mileage daily. One trade directory lists 120 civilian air schools and 82 concerns engaged in aerial photographic work. The Department of Commerce lists 123 manufacturers of aircraft exclusive of companies producing only motor car accessories.

The government had licensed, identified or granted temporary numbers to 6,528 planes and licensed 3,196 pilots up to September 1, 1928. Letters of authority to operate had been issued to 2,334 additional pilots. Permits issued or pending to student pilots numbered 5,906. The aircraft manufacturing industry is enjoying the enviable and almost unique distinction of being far behind on its orders. Last year the Army and Navy took 621 of the 1,995 planes produced. It is estimated that this year's output of planes will number over 4,000, of which the government will take a somewhat larger number than last year.—Commerce Monthly.

Reclaim Waste Materials

(Continued from page 26)

our plant, the work varies from a slender stem or turning approximately 2-in. in diameter and 18-in. in length, to a large table top or window divider. To expect one man to be thoroughly familiar with all the regulations of the spray gun and to change from the "fan" to the "round," and vice versa, in the proper proportion each time it is necessary, is asking too much.

In the past this meant that if the gun didn't happen to be properly adjusted for the turning, or if the nozzle was adjusted too fine for the large surfaces, the time lost would be excessive. Now, the work is segregated as much as possible and given to the various men who are familiar with that particular phase of it—men who are specialists.

Another element of saving became possible by grouping the articles to be sprayed. For instance, in spraying a table top 18-in. across, the operator fans the air to the left, then goes past the end of the job to the right and then back again. All this is necessary, but the loss is there nevertheless.

If two tops are laid together, the total measurement across is now 36-in. and the proportion of loss necessary is exactly one half the former method. This improved method has been the means of saving a considerable quantity of material, based on a run of nearly 1,000 tops, as we sprayed six at a time on a shelf-like arrangement and the time saved amounted to considerable

These are only typical examples of savings that can be effected and made at the place they should be made, that is the source—not in the waste pile. Too often the savings effected by salvaging waste material do not pay for the effort put forth, while a reduction of material and labor costs always produces direct results and is the criterion by which departments are judged.

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National Air Derby Winner Sprayed by HB Portable

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